PROSPECTIVE PAYMENT
ASSESSMENT COMMISSION

TECHNICAL APPENDIXES TO THE REPORT AND RECOMMENDATIONS TO THE SECRETARY, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

APRIL 1, 1986

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Introduction

Introduction

This volume of technical appendixes to ProPAC's April report seeks to provide the background material and detailed analyses that both informed the Commission's deliberations and ultimately helped shape its conclusions.

For the most part the contents consist of materials generated by ProPAC's staff; in a few instances the material was produced under contract and appears with attribution.

Readers seeking an overview of how the Medicare prospective payment system operates should consult the opening section of last year's technical appendix. Last year's volume also contained extensive analysis of the market basket element in the update factor, and issues in patient classification and DRG construction; those analyses remain relevant to ProPAC's ongoing efforts.

These appendixes are presented in five sections. Sections A and B correspond to the Commission's two major responsibilities, namely, updating and/or adjusting the PPS standardized payment amounts, and maintaining the adequacy of the DRG case mix measurement system for payment purposes.

A subject new to this year's ProPAC agenda, and the basis of several recommendations, pertains to the inclusion of capital costs in Medicare prospective payments. Appendix A thus includes extensive discussion of the capital issue.

Material in Appendix B includes considerations and statistical evidence regarding the capability of the present DRG system to respond appropriately to certain new costly technologies and high cost devices. In addition, the section details the Commission's review of a number of DRGs identified as requiring adjustment.

While quality of care considerations permeate the work and analyses of the Commission, Appendix C offers significant findings and information pertaining to three specific matters critical to quality assurance: beneficiary understanding of the operation of PPS, the role of Peer Review Organizations, and the nature of the appeals process available to challenge certain patient care decisions made by Medicare providers. Appendix C also contains an analysis of the distributional impact of the transition to national payment rates.

Two PPS-related compilations of materials comprise the last two sections: an updated and categorized list of current research efforts concerning a wide range of PPS issues, and the complete list of DRG weights.

Taken together, the appendixes, by creating a comprehensive record, seek to facilitate greater understanding of the policy judgments that resulted in the Commission Report's set of 33 recommendations.

Appendix A

Standardized Amounts and the Update Factor

Appendix A

Standardized Amounts and the Update Factor

INTRODUCTION

The Commission's mandate includes the development of recommendations regarding an appropriate annual percentage change in payments for hospital discharges (the "update factor"). Towards that end, Congress required consideration of the following elements:

1. Changes in the composition and prices of goods and services purchased by the hospital ("the hospital market basket");
2. Hospital productivity;
3. Technological and scientific advances;
4. The quality of health care provided;
5. Long-term cost-effectiveness in the provision of hospital services.

Based upon this charge, the Commission divided the update factor into two major components: a) changes in the market basket (inflation in goods and services purchased in the hospital) and b) changes in all other factors deemed relevant to updating payment. This latter category became termed the "discretionary adjustment factor" (DAF)—the quantitative factor in the update factor that accounts for changes in hospital productivity, substitution of site of care, scientific and technological advancement, real case-mix change, quality of health care, and long-term cost-effectiveness of services provided. The update factor can thus be expressed as an equation:

$$\text{Update} = \text{Market Basket} + \text{DAF}$$

Appendix A contains detailed background information regarding both ProPAC's specific update factor recommendation and several other recommendations related to the standardized amounts. For analysis of market basket issues, the reader should consult the 1985 Technical Appendix. This section begins with discussion of the assumptions and data underlying ProPAC's fiscal year 1987 DAF recommendation (including a separate discussion of the DAF for excluded hospitals). Other topics addressed relate to: recalculation of the standardized amounts (including a commissioned speed audit evaluation), labor market areas and the area wage index, and Medicare payments for hospital capital costs. One subject—the disproportionate share adjustment—was also extensively analyzed in last year's technical appendix. One other subject—rural hospital payments—encompasses issues that include but also extend beyond consideration of the standardized amount.

THE DISCRETIONARY ADJUSTMENT FACTOR (DAF)

The DAF is the quantitative expression of the Commission's policy judgment regarding the rate at which the Medicare standardized amounts (PPS hospitals) or hospital base-year costs (non-PPS hospitals) should increase or decrease beyond inflation in the hospital market basket. This judgment reflects considerations outlined in the statute as well as any other considerations which the Commission determines to be important.

The remainder of this discussion will focus on the development of the DAF for PPS hospitals. Factors considered in the development of the DAF for excluded facilities are outlined in a policy paper prepared by Lewin and Associates, Inc. for the Commission. An excerpt of this paper's Executive Summary is included elsewhere in the Technical Appendix.

Framework for the Development of the Fiscal Year 1987 Discretionary Adjustment Factor (DAF) for PPS Hospitals

For this report's fiscal year 1987 DAF recommendations, the Commission has adopted the same framework as was developed for its April 1985 Report.

The Commission believes that together with the market basket measure of inflation, the DAF recommendations should result in an update factor which represents the smallest rate of increase consistent with maintaining sufficient access to high quality hospital services for Medicare beneficiaries. While the Commission's recommendations do not explicitly take into account budgetary considerations related to the Medicare Trust Fund's solvency or the federal deficit, they were developed in recognition of a very constrained fiscal environment.

The Commission also recognizes that actions to reduce the federal deficit could have significant impact on the fiscal year 1987 update factor. Nevertheless, the Commission believes that the DAF should reflect its best judgment as to the amount necessary to provide efficient and effective hospital inpatient services.

Quantitative Foundation for the Fiscal Year 1987 DAF Recommendations

In constructing the DAF, the Commission is concerned with identifying factors that produce a change in the average cost of a discharge and determining the effect of these changes on the standardized amounts. The Commission recognizes that many factors can affect the average cost per case and that it is difficult to develop precise estimates of the impact of individual factors. Because these factors are so closely related, available data frequently reflect more than one DAF component. For example, length of stay reductions reflect hospital productivity changes as well as shifts of services from inpatient to out-of-hospital settings.

Despite these data limitations, the Commission has attempted to allocate its fiscal year 1987 overall DAF recommendation to the following four components considered in its development: 1) Scientific and Technological Advancement, 2) Hospital Productivity Change, 3) Site of Care Substitution, and 4) Real Case-Mix Change. A numeric allowance was developed for each component, after consideration of the interrelationships among the components. These allowances represent broad guidelines; they do not imply a high degree of precision or specificity in the estimation of individual components.

In total, the Commission recommends that the fiscal year 1987 update factor include a 0.5 percent reduction to accommodate the considerations outlined in the DAF recommendations, compared to a 0.2 percent reduction recommended for fiscal year 1986. The numeric value of the Commission's total DAF recommendation is subject to change in the next few months as more recent information on hospital case-mix change becomes available.

A comparison of the Commission's DAF recommendations for fiscal year 1986 and fiscal year 1987 follows:

DAF Component	*Percentage 1986*	*Allowance 1987*
Scientific and Technological Advancement	+1.5 to +2.0	+0.7
Hospital Productivity	−1.5 to −2.0	−1.5
Product Change/Site of Care Substitution	−1.0	−0.6
Net Adjustment (Before Inclusion of the Allowance for Real Case-Mix Change)	−1.0	−1.4
Real Case-Mix Change[1]	+0.8	+0.9
DAF Total	−0.2	−0.5

Within the overall DAF recommendation, the first two components (scientific and technological advancement, hospital productivity) represent policy goals, whereas the last two components (product change/site of care substitution) represent policy judgments about the incorporation of historical changes into future rates.

[1]The quantitative allowance for this adjustment was not included in last year's April recommendations but was subsequently estimated in the Commission's response to the Secretary's preliminary rule governing the FY 1986 PPS payment rates.

Although separate allowances for quality or long-term cost-effectiveness of care are not established, the Commission treats these factors as overarching considerations in setting the level of DAF and in examining each of the DAF components. More specifically, the Commission views quality and long-term cost-effectiveness as objectives to be achieved by implementation of rational payment policies.

In establishing the level of DAF, the Commission wishes to ensure that the Medicare program pays a reasonable price for inpatient hospital services so that access and quality of care will not be compromised. The Commission also wishes to establish a level that is limited so as to maintain the appropriate incentives for hospitals to continue to seek the most cost-effective techniques for providing services.

The remainder of this discussion outlines the quantitative information used to develop the Commission's fiscal year 1987 DAF recommendations.

Net Intensity

The Commission began the development of an overall DAF recommendation by examining trends in net intensity per admission. Net intensity is a measure of changes in hospital expenses per case after accounting for inflation (i.e., the inflation adjusted net effect of all the DAF components). Changes in net intensity per admission reflect productivity, case mix and patterns of practice changes, as well as errors in the measurement of input prices and time lags between input price increases and expenditure increases. Measures of net intensity also reflect increases in capital expenses that are currently not included in the PPS payments.

One way to evaluate growth in net intensity is to compare it to growth in the general economy as measured by the growth in "real" GNP, the gross national product adjusted for inflation. The growth in real GNP provides a useful barometer of change in relative "affordability" against which trends in the hospital industry can be evaluated.

During the period 1970-83, real GNP per capita grew at an average rate of 1.5 percent per year (Table A-1). From 1970 to 1983, net intensity per admission grew more than 3 percent annually. If the four years of wage and price controls in the early 1970s and voluntary cost containment in 1979 to 1980 are omitted, the average is closer to 4 percent annually. Under cost based reimbursement, hospitals faced few financial constraints in their ability to expand and add new services. Thus, prior to PPS, the industry generally grew at twice the rate of the general economy.

In 1984, the growth in net intensity per admission appeared to moderate (1.7 percent) but rose again to 3.9 percent in the first eight months of 1985. While it appears that the rate of real growth in hospital expenses per case continues to be approximately double that of the general economy, this most recent measure of net intensity masks some important changes under PPS.

Measures of intensity are sensitive to short-term shifts in volume. The recent increase in net intensity per case can largely be attributed to decreases in admissions rather than increases in hospital expenses.

While net intensity per case increased 3.9 percent in the first eight months of 1985, hospital admissions decreased 6.0 percent and expenses adjusted for inflation decreased approximately 2.2 percent during the first nine months of 1985 (Tables A-2 and A-3). That is, hospitals did reduce their expenses during the second year of PPS, but they did not reduce them quickly enough or to the extent necessary to offset the largest reduction in hospital admissions to have occurred in the past 15 years.

Scientific and Technological Advancement

In the Commission's first Report to the Secretary, the scientific and technological advancement allowance represented a future oriented policy target that would provide additional funds for the hospitals to improve their product by incorporating quality-enhancing but cost-increasing health care advances. The Commission included in its recommendation a positive allowance for this component of 1.5 to 2.0 percent of the standardized amount. For fiscal year 1987, the Commission has recommended a positive allowance of 0.7 for this component.

Table A-1.—Annual Percentage Changes In The Growth Of The General Economy Compared To The Inpatient Hospital Sector Of The Economy

Calendar Year	GNP	General Economy Inflation[a]	Real GNP Per Capita[b]	Inpatient Hospital Input Price Inflation	Inpatient Hospital Net Intensity Per Admission[c]
1970	5.2%	5.4%	−0.5%	6.5%	3.5%
1971	8.6	5.0	1.6	5.2	4.7
1972	10.1	4.1	4.6	5.0	3.6
1973	11.8	5.8	4.7	5.7	1.7
1974	8.1	8.9	−1.6	9.1	2.1
1975	8.0	9.2	−2.1	11.0	4.9
1976	10.9	5.2	4.4	8.7	5.6
1977	11.7	5.8	4.5	8.0	4.1
1978	12.8	7.4	3.9	8.7	2.9
1979	11.7	8.7	1.7	9.4	0.8
1980	8.8	9.2	−1.3	12.7	0.7
1981	12.3	9.4	1.3	13.3	3.6
1982	4.0	6.0	−2.9	9.4	5.7
1983	7.7	3.8	2.8	5.5	4.4
1984	11.0	4.0	5.6	5.7	1.7
1985[d]	5.8	3.3	1.5	5.3	3.9
Average Annual Increase	9.3	6.3	1.8	8.1	3.4

[a]General inflation is measured by the GNP price deflator.
[b]Real GNP is a residual category and represents a measure of the GNP adjusted for inflation.
[c]Net intensity per admission is a residual category of expenditures not accounted for by input prices. Along with additional resources applied to patient care, it may include productivity changes, changes in case mix, or patterns of use, errors in the measurement of input prices, and time lags between input price increases and expenditure increases.
[d]General economy data are for calendar year 1985. Hospital industry data are through 1984 and for the first 6 months of 1985.

SOURCE: Hospital input prices from the American Hospital Association. Net intensity calculated as a residual. GNP and general inflation measures through 1983 from Freeland and Schendler, HCF Review (spring 1984) and personal communication from Freeland; for 1984 and 1985 from the U.S. Department of Commerce. Real GNP is calculated as a residual. Population data from the U.S. Bureau of the Census.

Table A-2.—Percent Change In Hospital Admissions; Total Admissions, For Persons Under Age 65, And For Persons Over Age 65

	All Admissions	Admissions Per 1,000	Admissions Age Under 65	Admissions Per 1,000 Age Under 65	Admissions Age 65 And Over	Admissions Per 1,000 Age 65 And Over
1970	6.3%	5.9%	7.2%	7.1%	2.6%	0.4%
1971	0.4	−1.3	−0.3	−2.0	3.4	1.1
1972	2.6	1.4	1.6	0.5	6.1	3.8
1973	3.5	2.5	2.9	2.0	5.7	3.2
1974	3.7	2.7	3.0	2.2	6.0	3.4
1975	0.3	−0.7	−1.0	−1.7	4.5	1.6
1976	3.4	2.4	2.2	1.4	7.0	4.3
1977	2.5	1.5	1.9	1.1	4.4	1.7
1978	0.4	−0.6	−1.0	−1.9	4.9	2.3
1979	2.7	1.5	1.7	0.8	5.3	2.6
1980	2.9	1.7	1.5	0.4	6.7	4.3
1981	0.9	−0.2	0.0	−0.9	3.0	0.9
1982	0.0	−0.9	−1.6	−2.4	4.1	1.9
Average Increase 1971-82	2.3	1.2	1.4	0.5	4.9	2.4
1983	−0.5	−1.5	−2.8	−3.6	4.7	2.6
1984	−3.7	−4.7	−4.2	−5.0	−2.6	−4.7
1985[a]	−6.0	−6.9	−5.9	−6.6	−6.1	−8.1
Average Increase 1983-85	−3.4	−4.3	−4.3	−5.1	−1.3	−3.4

[a]1985 estimate based on first eight months of data compared to first eight months of 1984.

SOURCE: Admission data from the American Hospital Association National Panel Survey. Population data from the U.S. Department of Commerce, Bureau of the Census.

Table A-3.—Percentage Changes In The Real Growth Of The General Economy Compared To The Real Growth In Hospital Expenses—1983 Through First 6 Months of 1985[a]

Calendar Year	Real Inpatient Expenses	Real GNP
1983	3.8%	3.8%
1984	−2.4	6.7
1985[b]	−2.2	2.4
Average Annual Increase 1983-1985	−0.3	4.3

[a]Real growth in the hospital industry or the economy as a whole represents growth in dollars above that amount accounted for by inflation.
[b]Data for the economy as a whole is estimated for calendar year 1985; data for the hospital industry is based on the first 6 months of calendar 1985.

SOURCE: Inpatient expense data from the American Hospital Association National Panel Survey. GNP measures for 1983 from Freeland and Schendler, HCF Review (Spring 1984) and personal communication from Freeland; for 1984 and 1985 from the U.S. Department of Commerce.

The reduction of this component from the Commission's fiscal year 1986 recommendation partially reflects allocation of some of the observed changes in net intensity to the real case-mix change component of the DAF. It also partially reflects the offset for additional science and technology funds provided by the recommended add-on payments for MRI (Recommendation 29). The Commission believes that targeted adjustments of this type should be offset in the DAF so that the total amount allowed remains unchanged by the addition of an add-on payment.

Under current law, financial support for new technologies also is provided through the retrospective cost-based reimbursement for capital expenses (capital pass-through). In 1985, the Commission estimates that growth in capital expenses (adjusted for inflation) contributed 1.0 percentage point to the 3.9 percent increase in net intensity per case. If capital is incorporated into the standardized amounts at a level lower than projected under current law, the scientific and technological advancement component of the DAF should be increased to reflect the additional appropriate capital resources required for funding this component of the DAF. Development of measures upon which to base the scientific and technological advancement allowance is hampered by limited data. Last year, comparisons were made of real growth in the general economy (taking inflation into account) to growth in the hospital industry as measured by increases in net intensity.

As noted above, however, measures of net intensity provide an indication of the impact of changes in all the DAF components on hospital expenses per case. This measure does not provide a direct indication of the historical investment in scientific and technological advancement, let alone a measure of quality enhancing cost effective technologies.

This year, the Commission has attempted to obtain an estimate of the potential impact on Medicare costs per case of newly introduced devices or treatments by examining a select group of technologies that have been identified through the Commission's process for analyzing the adequacy of individual DRG payments. Although the estimates in Table A-4 reflect only a select subset of technologies, the conclusion still emerges that all of the cost-increasing technologies taken together add no more than $57 million to Medicare costs per case (approximately a 0.14 percentage point contribution to the DAF).

Funds for new technologies, however, constitute only a fraction of the amounts the Commission considers appropriate for inclusion in this allowance. A broader definition of scientific and technological advancement would not be limited to the impact of high cost new technologies, but would reflect changes in hospital expenses attributable to diffusion of new technologies over time and changes in practice patterns. This broader definition would encompass funds to cover hospital expenses that might be incurred to enhance the quality of services related to improvements in relatively low cost technologies ("little ticket" items) or those related to relatively high cost technologies ("big ticket" items).

Two recent papers[2] [3] lend support to the Commission's decision to consider a broader definition in the development of this DAF component. These studies conclude that changes in practice patterns may have a far more substantial effect on treatment costs than simply the purchase of new devices. In a select number of conditions, the

[2]Showstack, J.A., Stone, M.H., and Schroeder, S.A., " The Role of Changing Clinical Practices In the Rising Costs of Hospital Care," *N.E.J.M.*, 313(19):1201-1207, November 7, 1985.

[3]Scitovsky, A.A., "Changes in the Cost of Treatment of Selected Illnesses," 1971-1981, Medical Care, 23(12): 1345-1356, December 1985.

Table A-4.—Specific Technologies And Treatment Changes Examined By ProPAC

Technology/ Treatment Change	Estimated Impact on Medicare Patient Costs/Yr[a]	Assumptions
COST INCREASING TECHNOLOGIES:		
MRI	$27 Million	Assumes add-on payments to the 70% of discharging hospitals that own MRIs of $124 per scan, add-on payments to the 30% not owning MRIs of $282 per scan, and 157,500 Medicare inpatients scans per year. Add-on payments are average costs, with the operating cost component adjusted by 30% to account for substitution with other imaging techniques.
Pacemakers	$10.2 Million	Estimates that 35% of patients will receive dual-chamber pacemakers. An estimated 25% of pacemaker patients currently receive them.
Implantable Defibrillators	$8.4 Million	The manufacturer expects to supply 300 devices to Medicare patients in the next year. The estimated average cost per case is $28,000.
Heart Transplants	$1.9-2.1 Million	National Heart Transplant Study estimates, assuming Medicare coverage in the near future. The number of Medicare eligible recipients is estimated to be 32 per year in 1986. Estimated cost per case is $60,000-66,000.
Thoraco-Abdominal Aortic-Aneurysm Resection	$1.1-2.3 Million	Assumes 250 Medicare patients/yr with average costs $5,000-$10,000 more than for other surgery for aortic aneurism repair. To date, only 5 to 6 hospitals perform this surgery.
Cochlear Implantation	$6.9 Million	Assumes that 500 Medicare patients receive an implant in the first year of coverage, 30% single channel devices at $8,160 per hospitalization and 70% double channel devices at $16,120/hospitalization.
COST DECREASING TECHNOLOGIES:		
Extracorporeal Shockwave Lithotripsy	($9.2 Million)	Assumes 168 cases/yr per hospital at 40 hospitals in fiscal year 1987. Assumes 10% of the ESWL cases would not have had surgery. A 10% ESWL failure rate was included in the cost savings. Conventional stone surgery cost per case was estimated to be $5,667 and average cost per case of ESWL was estimated at $3,120.
Percutaneous Transluminal Angioplasty	($74.1 Million)	Assumes substitution of PTCA for coronary artery bypass. There were 7,563 Medicare cases in fiscal year 1984. Another 748 patients are estimated to have failed PTCA and required coronary artery bypass surgery during the same hospitalization. Average costs were $5,905 for simple PTCA cases and $15,707 for DRG 108 cases (other cardiac or thoracic procedures with pump).

[a]Estimates of incremental change in operating costs for Medicare beneficiaries in the next year. Does not include costs or savings related to followup care. Cochlear implants and heart transplants are not currently covered services. Many of these technologies are expected to diffuse rapidly within several years with accompanying large increases in incremental costs. For example, currently about 18,000 Medicare patients/year are candidates for the implantable defibrillator, and there are an estimated 70,000 total Medicare recipients who may benefit from cochlear implantation.

SOURCE: ProPAC estimates.

studies found substantial rises in costs for diagnoses involving new treatment modalities such as breast cancer and acute myocardial infarction and only moderate changes in those without major treatment changes such as cataract excision, total hip replacement, and duodenal ulcer. Because of the small number of conditions studied relevant to the Medicare population and the involvment of only two institutions, quantitative estimates for the DAF cannot be drawn from these studies. Nevertheless, they do suggest that the estimates for this component of the DAF should be broader than simply the cost of new devices. It is important to note, however, that a substantial

portion of the increased costs associated with changing patterns of practice will be accounted for elsewhere in the DAF, namely in the provisions for real case-mix change.

Productivity/Efficiency Potential

The productivity allowance in the DAF is a future oriented target that partially reflects potential changes in both efficiency and productivity resulting from PPS incentives to reduce the number and cost of resources used to treat patients. In part, however, this allowance also reflects the success of past hospital efforts to achieve productivity gains that are continuing to be realized in the present. The Commission adopted the position that it is both desirable and appropriate for productivity gains to be translated into price reductions. These price reductions are expected to occur over time. Thus the fruits of productivity gains may not be realized in a single year but accrue over time.

The Commission also adopted the principle that such gains should be shared between the Medicare program, the Medicare beneficiaries, and the hospital industry. Productivity decreases, however, should not be directly subsidized by the PPS.

The following measures of practice pattern change serve as indicators of the potential for productivity improvement.

Average Length of Stay.—Data from the American Hospital Association's National Panel Survey indicates that length of stay has fallen almost continuously since 1970 (Table A-5). Length of stay continued to fall during the first eight months of 1985 but the rate of decrease has substantially slowed compared to 1984. The percent decline continues to be greatest for those age 65 or older compared to all adults combined (-2.9 percent for those age 65 and older compared to -2.1 percent for all adults). As can be seen in Table A-6, the major sources of reduction in Medicare patients' average length of stay during the early stages of PPS can be attributed to reductions in routine days, and among surgical cases, to reductions in post-op days. Applying the 60 percent marginal cost assumption adopted in last year's report, and adjusting for site substitution and changes in real case mix accounted for elsewhere in the DAF, the 2.9 percent reduction in length of stay potentially could yield a 2.2 percent reduction in costs. If this cost savings is to be shared between the industry and the program, then the 2.2 percent reduction would be translated into about a 1.1 percent reduction in price.

Ancillary Services.—Medicare program data indicate that inflation adjusted total ancillary charges for patients remained relatively constant between 1981 and 1984. This finding may mask significant productivity gains made by the hospital industry in certain departments. For example, laboratory and radiology Medicare patient charges, as a percentage of total Medicare ancillary charges, decreased slightly, while drugs and medical supplies increased slightly during this period. Evidence from a study conducted for ProPAC by the Commission on Professional and Hospital Activities (CPHA), and Monitrend data from the AHA provide further indication that hospitals are reducing the amounts of certain ancillary services provided to patients and increasing the provision of others.

Monitrend data are based on a self-selected sample of hospitals subscribing to the AHA's Hospital Administrative Service. The data permit analyses of productivity trends for only a limited subset of ancillary services. These data are for all discharges from the hospital; therefore they do not permit comparison of the experience of Medicare patients to non-Medicare patients.

Nevertheless, these data provide an indication of the potential for productivity gains that is consistent with trends found in the Medicare program data and data from the CPHA study described below, although the magnitude of the potential changes may not be comparable from data set to data set. The Monitrend data show consistent declines in workload units or procedures per discharge for laboratory, diagnostic radiology and EEG/ECG/EKG services, and increases in CAT scans since 1983 (Table A-7).

The CPHA data set is derived from a group of 729 hospitals, of which 165 provided data for this portion of the project. Data from the CPHA indicate that for laboratory items and diagnostic test items, the proportion of Medicare patients receiving a given service did not decline between 1980

Table A-5.—Trends In Hospital Length Of Stay (LOS) For All Adults, And For Persons Over Age 65

	LOS, All Adults	Percent Change LOS, All Adults	LOS Age 65 And Over	Percent Change LOS' Age 65 And Over
1970	7.82	−3.1%	12.62	−3.0%
1971	7.66	−2.0	12.22	−3.1
1972	7.56	−1.4	11.74	−4.0
1973	7.44	−1.5	11.40	−2.9
1974	7.38	−0.8	11.31	−0.8
1975	7.38	0.0	11.23	−0.7
1976	7.37	−0.1	11.05	−1.6
1977	7.25	−1.7	10.71	−3.0
1978	7.22	−0.3	10.59	−1.2
1979	7.15	−1.0	10.39	−1.9
1980	7.18	0.5	10.38	−0.1
1981	7.21	0.4	10.36	−0.1
1982	7.16	−0.6	10.13	−2.3
Average 1970-82	7.37	−0.9	11.09	−1.8
1983	7.02	−2.0	9.68	−4.5
1984	6.66	−5.1	8.94	−7.6
1985[a]	6.54	−2.1	8.74	−2.9
Average 1983-85	6.74	−3.1	9.12	−5.0

[a]Estimate based on first eight months of data compared to first eight months of 1984.

SOURCE: American Hospital Association National Panel Survey.

Table A-6.—Distribution Of The Changes In Length Of Stay By Type Of Patient Day—1981 To 1984

Length Of Stay Variable	Difference In Days 1981-84	Percent Distribution
All Discharges		
Average Length Of Stay	−1.04	100.0%
Average Special Care Days/Discharge	−0.01	1.0
Average Routine Days/Discharge	−1.03	99.0
Surgical Discharges[a]		
Average Length Of Stay[b]	−1.03	100.0%
Average Special Care Days/Discharge	−0.03	2.9
Average Routine Days/Discharge	−1.00	97.1
Average Pre-Op Days/Discharge	−0.11	10.8
Average Post-Op Days/Discharge	−0.91	89.2

[a]Discharges classified into surgical DRG categories.
[b]Individual components may not add to the total difference in length of stay due to rounding errors.

SOURCES: 1981 MEDPAR and 1984 PATBILL files.

and 1984. Rather, the decline has occurred in the average number of ancillary items received by each Medicare patient. In 1984, the decline in ancillary items recorded per discharge for laboratory and diagnostic testing was substantial in the CPHA hospitals, even though the average number of drug items received increased slightly (Table A-8).

The potential for productivity gains was analyzed by applying the distribution of 1984 charges (adjusted for costs)[4] for Medicare inlier patients (Table A-9) to the reduction in ancillary services found in the Monitrend and CPHA data sets. Based on these analyses, the Commission has concluded that reduction in the use of selected ancillary services could contribute to between a 0.6 and a 2.5 percent reduction in hospital inpatient

[4]Mark-up ratio for ancillary services estimated to be 1.40; mark-up ratio for all services estimated to be 1.25; ratio applied to the Medicare charge distribution to obtain costs = 1.25/1.40.

Table A-7.—Ancillary Service Productivity Indicators—Monitrend Data, 1983-85

Laboratory:

Bed Size	Weights (Proportion Of Sample in 1985)	Workload Units Per Adjusted Discharge-1983	Workload Units Per Adjusted Discharge-1984	Difference 1983 & 1984	Workload Units Per Adjusted Discharge-1985	Difference 1984 & 1985
<50	0.1192	257.25	258.43	1.18	247.74	−10.69
50-74	0.1131	244.93	236.17	−8.76	219.62	−16.55
75-99	0.1094	252.55	230.99	−21.56	230.13	−0.86
100-149	0.1444	256.10	256.49	0.39	245.82	−10.67
150-199	0.1199	264.16	249.22	−14.94	250.32	1.10
200-299	0.1893	281.03	269.96	−11.07	264.61	−5.35
300-399	0.1100	310.10	280.55	−29.55	270.55	−10.00
400+	0.0947	307.47	296.60	−10.87	298.98	2.38

1983 Weighted Average Workload Units Per Discharge: 271.08

1984 Weighted Average Workload Units Per Discharge: 259.76
Percent Change From Previous Year: −4.2%

1985 Weighted Average Workload Units Per Discharge: 253.22
Percent Change From Previous Year: −2.5%

ECG/EEG/EKG:

Bed Size	Weights (Proportion Of Sample in 1985)	Workload Units Per Adjusted Discharge-1983	Workload Units Per Adjusted Discharge-1984	Difference 1983 & 1984	Workload Units Per Adjusted Discharge-1985	Difference 1984 & 1985
<50	0.1192	15.48	13.86	−1.62	12.55	−1.31
50-74	0.1131	17.50	17.13	−0.37	15.33	−1.80
75-99	0.1094	19.06	17.97	−1.09	17.27	−0.70
100-149	0.1444	20.19	19.16	−1.03	19.36	0.20
150-199	0.1199	21.67	20.59	−1.08	21.25	0.66
200-299	0.1893	22.23	21.85	−0.38	23.56	1.71
300-399	0.1100	27.54	26.30	−1.24	25.20	−1.10
400+	0.0947	28.00	27.73	−0.27	24.50	−3.23

1983 Weighted Average Workload Units Per Discharge: 21.31

1984 Weighted Average Workload Units Per Discharge: 20.45
Percent Change From Previous Year: −4.0%

1985 Weighted Average Workload Units Per Discharge: 20.01
Percent Change From Previous Year: −2.2%

Diagnostic Radiology:

Bed Size	Weights (Proportion Of Sample in 1985)	Workload Units Per Adjusted Discharge-1983	Workload Units Per Adjusted Discharge-1984	Difference 1983 & 1984	Workload Units Per Adjusted Discharge-1985	Difference 1984 & 1985
<50	0.1192	1.54	1.45	−0.09	1.39	−0.06
50-74	0.1131	1.97	1.87	−0.10	1.78	−0.09
75-99	0.1094	1.99	1.86	−0.13	1.74	−0.12
100-149	0.1444	2.12	2.03	−0.09	2.04	0.01
150-199	0.1199	2.27	2.11	−0.16	2.09	−0.02
200-299	0.1893	2.39	2.35	−0.04	2.26	−0.09
300-399	0.1100	2.48	2.33	−0.15	2.33	0.00
400+	0.0947	2.57	2.44	−0.13	2.44	0.00

1983 Weighted Average Workload Units Per Discharge: 2.17

1984 Weighted Average Workload Units Per Discharge: 2.07
Percent Change From Previous Year: −4.6%

1985 Weighted Average Workload Units Per Discharge: 2.02
Percent Change From Previous Year: −2.4%

Table A-7.—Ancillary Service Productivity Indicators—Monitrend Data, 1983-85—Continued

CT Scanner:

Bed Size	Weights (Proportion Of Sample in 1985)	Workload Units Per Adjusted Discharge-1983	Workload Units Per Adjusted Discharge-1984	Difference 1983 & 1984	Workload Units Per Adjusted Discharge-1985	Difference 1984 & 1985
<50	0.1192	0.01	0.04	0.03	0.04	0.00
50-74	0.1131	0.05	0.06	0.01	0.07	0.01
75-99	0.1094	0.07	0.06	−0.01	0.07	0.01
100-149	0.1444	0.08	0.08	0.00	0.10	0.02
150-199	0.1199	0.10	0.10	0.00	0.13	0.03
200-299	0.1893	0.12	0.14	0.02	0.15	0.01
300-399	0.1100	0.14	0.15	0.01	0.16	0.01
400+	0.0947	0.16	0.18	0.02	0.19	0.01

1983 Weighted Average Workload Units Per Discharge:	0.09
1984 Weighted Average Workload Units Per Discharge:	0.10
Percent Change From Previous Year:	11.1%
1985 Weighted Average Workload Units Per Discharge:	0.11
Percent Change From Previous Year:	10.0%

SOURCE: American Hospital Association, Hospital Activities Survey/Monitrend Discharge Based Data, January-June 1983, 1984, and 1985.

Table A-8.—Service Input Utilization Data—Medicare Patients

	Proportion Of Patients Receiving At Least One Laboratory Item	Average Number Of Laboratory Items Per Discharge	Percent Change Average Number Of Laboratory Items Per Discharge
1980	0.990	15.427	
1981	0.990	15.582	1.0%
1982	0.990	15.824	1.6
1983	0.989	15.626	−1.3
1984	0.986	10.302	−34.1

	Proportion Of Patients Receiving At Least One Diagnostic Test Item	Average Number Of Diagnostic Test Items Per Discharge	Percent Change Average Number Of Diagnostic Test Items Per Discharge
1980	0.776	1.124	
1981	0.787	1.154	2.7%
1982	0.794	1.183	2.5
1983	0.790	1.176	−0.6
1984	0.746	1.003	−14.7

	Proportion Of Patients Receiving At Least One Drug Item	Average Number Of Drug Items Per Discharge	Average Number Of Drug Items Per Discharge
1980	0.834	1.975	
1981	0.836	2.013	1.9%
1982	0.848	2.073	3.0
1983	0.849	2.092	0.9
1984	0.863	2.172	3.8

SOURCE: Commission on Professional and Hospital Activities (ProPAC Contract Number T-33726021).

Table A-9.—Average Total Charges And Average Total Departmental Charges (Inliers Only)

	Dollars		Percentages	
	1981	1984	1981	1984
Total	2,637.50	3,545.50	100.0%	100.0%
Total Room And Board	1,199.03	1,447.00	45.5	40.8
Routine	1,039.77	1,237.92	39.4	34.9
Special Care	159.26	209.08	6.0	5.9
Total Ancillary	1,431.93	2,081.56	54.3	58.7
Anesthesia	33.06	45.42	1.3	1.3
Drugs	262.81	409.40	10.0	11.5
Inhalation	124.35	171.06	4.7	4.8
Laboratory	306.79	408.30	11.6	11.5
Medical Supplies	178.30	292.37	6.8	8.2
Other	208.72	314.26	7.9	8.9
Operating Room	170.69	251.02	6.5	7.1
Radiology	147.21	251.02	5.6	7.1

SOURCE: FY 1981 MEDPAR and FY 1984 PATBILL.

costs. As noted above, however, these savings may not result in a reduction in total inpatient ancillary costs since a reduction in the use of one service may be offset by an increase in the use of another.

Nonetheless, in addition to length of stay data, these data provide an indication of the potential for hospital productivity gains. Ancillary productivity improvements, however, are not entirely additive to the savings from length of stay reductions; the 60 percent marginal cost assumption used to translate length of stay reductions to cost savings includes some ancillary savings.

Staffing Patterns.—Last year, the Commission examined changes in staffing patterns as one indicator of the potential for further productivity gain. The Commission noted that full-time equivalent employees had declined in hospitals but this decline was less than the decline in admissions or length of stay. As a result, full-time staff per admission or per day had increased. The Commission reasoned that this increase reflected the natural lag between changes in demand and staffing reductions. Thus the Commission concluded that over the coming year or two, hospitals would adjust to the incentives of PPS and to the lower demand for hospital services by reducing staffing levels. Staffing trends between 1984 and 1985 are summarized below:

- While the use of both full-time and part-time labor has declined, the percent change has been greater in the full-time category during the first 8 months of 1985. Full-time equivalent inpatient staff declined by 5 percent during this period.
- Admissions continue to fall at a greater rate than the decline in full-time equivalents. As a result, full-time equivalents per day as well as per admission continued to rise during the first 8 months of 1985 (Tables A-10 and A-11).

In summary, faced with the new incentives in the health industry, including PPS, hospitals have begun to experience a reduction in the work force, a reduction, however,that has lagged behind significant changes in hospital practice patterns as reflected in reductions in admissions and average length of stay. This would suggest that, over the next year or two, hospitals may have a potential margin for productivity improvement from which to fund technological advances.

Site of Care Substitution

This DAF component reflects changes in inpatient resources resulting from the provision of out-of-hospital services to patients who formerly received such services during their inpatient stay. The Commission believes that the Medicare program or the Medicare beneficiary may be overpaying for these services since the cost of services no longer rendered in the inpatient unit remain in the cost base used to establish the DRG

Table A-10.—Changes In Labor Utilization

	Percent Change Total Full-Time Personnel	Percent Change Total Part-Time Personnel	Percent Change Full-Time Equivalents	Percent Change Inpatient FTES	Percent Change Inpatient FTES Per Admission	Percent Change Inpatient FTES Per Patient Day
1971	2.6%	2.4%	2.6%	2.2%		
1972	3.7	4.0	3.7	3.2		
1973	3.0	5.4	3.3	2.7		
1974	3.8	8.9	4.5	4.1		
1975	4.9	5.3	5.0	4.4	4.1%	4.0%
1976	6.1	6.3	6.1	5.8	2.3	2.5
1977	5.0	5.3	5.1	4.6	2.1	3.9
1978	3.3	6.8	3.7	3.2	2.8	3.1
1979	3.0	6.7	3.5	3.3	0.7	1.7
1980	4.0	9.1	4.7	4.5	1.6	1.1
1981	4.4	9.4	5.4	5.1	4.3	3.9
1982	4.0	4.1	3.7	3.4	3.4	4.0
Average Increase 1971-82	4.0	6.2	4.3	3.9	2.6	3.0
1983	1.2	2.3	1.4	0.8	1.4	3.4
1984	−2.6	−0.8	−2.3	−3.5	0.2	5.6
1985[a]	−3.4	−1.2	−3.0	−5.0	1.0	3.2
Average Increase 1983-85	−1.6	0.1	−1.3	−2.6	0.8	4.1

[a]1985 estimate based on first eight months of data compared to first eight months of 1984.

SOURCE: The American Hospital Association National Panel Survey.

Table A-11.—Changes In Employment And Employee Related Expenses

	Percent Change FTES	Percent Change Average Salary	Percent Change Employee Benefits Per FTE	Percent Change Labor Expenses Per FTE	Percent Change Inpatient FTES	Percent Change Inpatient Labor Expense Per Inpatient FTE
1971	2.6%	6.4%			2.2%	
1972	3.7	6.7			3.2	
1973	3.3	5.3			2.7	
1974	4.5	7.5			4.1	
1975	5.0	9.3	16.1%	10.0%	4.4	10.0%
1976	6.1	9.0	20.3	10.3	5.8	10.2
1977	5.1	8.0	14.1	8.7	4.6	8.7
1978	3.7	8.4	12.0	8.9	3.2	8.9
1979	3.5	9.3	10.3	9.4	3.3	9.4
1980	4.7	11.3	11.9	11.4	4.5	11.4
1981	5.4	12.5	17.0	13.1	5.1	13.1
1982	3.7	11.0	18.8	12.0	3.4	12.0
Average Increase 1971-82	4.3	8.7	15.1	10.5	3.9	10.5
1983	1.4	7.2	11.9	7.9	0.8	7.9
1984	−2.3	5.6	10.0	6.3	−3.5	6.2
1985[a]	−3.0	6.6	7.6	6.7	−5.0	6.7
Average Increase 1983-85	−1.3	6.5	9.9	7.0	−2.6	6.9

[a]1985 estimate based on first eight months of data compared to first eight months of 1984.

SOURCE: The American Hospital Association National Panel Survey.

payment rates. As such, the Commission has recommended that a negative adjustment be included in the DAF to reflect this type of site of care substitution.

Ideally, analyses of site substitution would include examination of the services received by a patient throughout an episode of illness. At the time this report was prepared, however, data tracing the costs of an episode of illness for Medicare patients were unavailable to the Commission.

Medicare program data serve as one indicator of trends in site of care substitution. These data indicate a steady reduction in the proportion of Medicare program expenditures for inpatient services and an increase in the proportion for noninpatient services (Tables A-12 and A-13).

Table A-12.—Estimated Medicare Benefits Payments By Type Of Provider—In Millions Of Dollars

	Inpatient Hospital		Outpatient Hospital[a]		Physician[b]		Skilled Nursing		Home Health[c]	
	Dollars	Percent Change	Dollars	Percent Change	Dollars	Percent Change	Dollars	Percent Change	Dollars	Percent Change
1970	4,452		93		1,814		298		89	
1971	5,182	16.4%	137	47.3%	1,831	0.9%	214	−28.2%	76	−14.6%
1972	5,887	13.6	174	27.0	1,996	9.0	174	−18.7	84	10.5
1973	6,412	8.9	175	0.6	2,118	6.1	179	2.9	100	19.0
1974	7,513	17.2	319	82.3	2,426	14.5	214	19.6	138	38.0
1975	9,947	32.4	509	59.6	3,065	26.3	273	27.6	228	65.2
1976	11,742	18.0	717	40.9	3,690	20.4	308	12.8	339	48.7
1977	14,265	21.5	953	32.9	4,599	24.6	351	14.0	441	30.1
1978	16,684	17.0	1,184	24.2	5,327	15.8	354	0.9	543	23.1
1979	19,067	14.3	1,445	22.0	6,397	20.1	364	2.8	647	19.2
1980	22,842	19.8	1,809	25.2	7,814	22.2	387	6.3	772	19.3
1981	27,744	21.5	2,215	22.4	9,513	21.7	424	9.6	959	24.2
1982	32,729	18.0	2,916	31.6	11,392	19.8	454	7.1	1,176	22.6
1983	36,083	10.2	3,342	14.6	13,498	18.5	500	10.1	1,545	31.4
1984	39,050	8.2	3,739	11.9	14,936	10.7	545	9.0	1,898	22.8

[a]Includes payment for routine maintenance dialysis treatments since fiscal year 1974.
[b]Includes payments for durable medical equipment, ambulance, and several other nonphysician services covered under Medicare Supplemental Health Insurance.
[c]Includes benefits paid under Medicare Hospital Insurance and Supplemental Medical Insurance.

SOURCE: Health Care Financing Administration, Office of Financial and Actuarial Analysis.

Table A-13.—Estimated Medicare Benefits Payments By Type Of Provider—Percent Of Total Payments

	Inpatient Hospital		Outpatient Hospital[a]		Physician[b]		Skilled Nursing		Home Health[c]	
	% Of Total	Difference From Previous Year	% Of Total	Difference From Previous Year	% Of Total	Difference From Previous Year	% Of Total	Difference From Previous Year	% Of Total	Difference From Previous Year
1970	66.0%		1.4%		26.9%		4.4%		1.3%	
1971	69.7	3.7	1.8	0.5	24.6	−2.3	2.9	−1.5	1.0	−0.3
1972	70.8	1.1	2.1	0.3	24.0	−0.6	2.1	−0.8	1.0	0.0
1973	71.4	0.6	1.9	−0.1	23.6	−0.4	2.0	−0.1	1.1	0.1
1974	70.8	−0.6	3.0	1.1	22.9	−0.7	2.0	0.0	1.3	0.2
1975	70.9	0.1	3.6	0.6	21.9	−1.0	1.9	−0.1	1.6	0.3
1976	69.9	−1.0	4.3	0.6	22.0	0.1	1.8	−0.1	2.0	0.4
1977	69.2	−0.7	4.6	0.4	22.3	0.3	1.7	−0.1	2.1	0.1
1978	69.3	0.0	4.9	0.3	22.1	−0.2	1.5	−0.2	2.3	0.1
1979	68.3	−1.0	5.2	0.3	22.9	0.8	1.3	−0.2	2.3	0.1
1980	67.9	−0.4	5.4	0.2	23.2	0.3	1.2	−0.2	2.3	0.0
1981	67.9	0.0	5.4	0.0	23.3	0.0	1.0	−0.1	2.3	0.1
1982	67.3	−0.7	6.0	0.6	23.4	0.1	0.9	−0.1	2.4	0.1
1983	65.6	−1.6	6.1	0.1	24.6	1.1	0.9	0.0	2.8	0.4
1984	64.9	−0.7	6.2	0.1	24.8	0.3	0.9	0.0	3.2	0.3

[a]Includes payment for routine maintenance dialysis treatments since fiscal year 1974.
[b]Includes payments for durable medical equipment, ambulance, and several other nonphysician services covered under Medicare Supplemental Health Insurance.
[c]Includes benefits paid under Medicare Hospital Insurance and Supplemental Medical Insurance.

SOURCE: Health Care Financing Administration, Office of Financial and Actuarial Analysis.

The Medicare program data, however, represent changes that are due to a variety of factors. Reductions in admissions due to shifts in the site of care for all patients (both those admitted, as well as those not admitted to the hospital) are reflected in reductions in Medicare inpatient expenditures. Similarly, increases in the proportion of expenditures for out-of-hospital services include increased expenditures for patients never admitted to the hospital as well as expenditures for those admitted. While these data serve as a useful indicator of the existence of site substitution, the Commission concluded that it would be inappropriate to use them for estimating the magnitude of the substitution of non-inpatient services rendered to inpatients during either the pre- or post-hospitalization period.

Consequently, analyses of changes due to site substitution have been largely limited to analyses of CPHA data, the only data currently available to the Commission that reflects possible shifts in site of care for patients admitted to the hospital. In the CPHA analyses, changes in disposition status (e.g., discharge home with home health services) are analyzed to indicate possible shifts in site of care. These changes in disposition categories do not represent a direct measure of shift in services since they represent changes in services ordered rather than services received by patients. Nevertheless, they do provide some indication of changes that are correlated to site substitution.

Preliminary results from this study are presented in Table A-14. This table shows:

- The proportion of Medicare patients discharged home with home health services increased significantly between 1983 and 1984. The proportion discharged to SNF or ICF care has increased steadily since 1982.
- The trends for the non-Medicare population have remained relatively stable during the period under study.

When changes in the proportion of Medicare patients discharged to other organized sites of care are considered together with changes in length of stay, we estimate that site substitution between 1983 and 1984 accounted for a 0.2 percentage point reduction in length of stay or a 0.12 percentage point reduction in Medicare patient cost per case, assuming marginal costs at 60 percent of the cost of a patient day.

The Commission believes, however, that these results substantially underestimate the magnitude of site substitution that has occurred under PPS.

Table A-14.—Proportion Of Total Medicare And Non-Medicare Discharges By Discharge Disposition Category, 1980-84

	Medicare				
Disposition	1980	1981	1982	1983	1984
Discharged Home Or Self Care	.806	.805	.806	.800	.772
Discharged To Short Term Hospitals	.017	.017	.017	.018	.020
Discharged To SNF Or ICF[a]	.089	.089	.088	.090	.099
Discharged To Home Health Services	.023	.026	.027	.033	.050
Discharged Dead	.065	.063	.062	.059	.059
Total	1.000	1.000	1.000	1.000	1.000
Number of Discharges	(410,323)	(426,644)	(448,287)	(467,102)	(416,023)

	Non-Medicare				
Disposition	1980	1981	1982	1983	1984
Discharged Home Or Self Care	.974	.974	.973	.971	.968
Discharged To Short Term Hospitals	.011	.011	.012	.013	.014
Discharged To SNF Or ICF[a]	.002	.002	.002	.003	.003
Discharged To Home Health Services	.004	.004	.004	.005	.006
Discharged Dead	.009	.009	.009	.008	.009
Total	1.000	1.000	1.000	1.000	1.000
Number of Discharges	(100,216)	(99,402)	(95,332)	(91,925)	(86,947)

[a]SNF-Skilled Nursing Facility; ICF-Intermediate Care Facility.

SOURCE: Commission on Professional and Hospital Activities (ProPAC Contract Number T-33726021).

In large part, this underestimate arises because CPHA data reflect only a small subcomponent of site substitution. That is, they reflect discharge disposition to formal sites of care (e.g., discharge to nursing homes, discharge to home with home health services). They do not reflect follow-up care in physician's offices or outpatient departments, the results of earlier discharge to out-of-hospital care settings or home care, or the use of pre-admission diagnostic tests and other services. Moreover, a large number of hospitals were not on PPS or were only on PPS for a short period of time in 1984, and thus had limited exposure to the incentives under PPS for site substitution. As a result, the Commission has chosen to specify an allowance of 0.6 percent to reflect its best judgment as to the total effect of site substitution on reducing Medicare cost per case, rather than the more narrow site substitution reflected in the CPHA data set.

Case Mix

In last year's April Report, the Commission concluded that since PPS payments automatically reflect all changes in reported case mix as they occur, an adjustment would be necessary to ensure that only changes related to the types of patients treated be built into future payment rates. Therefore, the Commission recommended a lowering of all the DRG weights to adjust for changes in DRG distribution occurring during fiscal year 1985; it further recommended a portion of the resulting reductions in PPS payments be returned to the hospitals through the DAF adjustment for changes in the types of patients treated ("real" case-mix change).

While specific in its recommendation for the structure of a case mix adjustment, the Commission did not provide a quantitative estimate of the adjustment in last year's April Report. Subsequently, the Commission provided a single quantitative estimate of real case-mix change in its response to the Secretary's proposed regulations.

The Commission's estimate was based on a preliminary study by the Rand Corporation (June 1985).[5] Rand estimated that a 0.5 percent quarterly increase in the Medicare case-mix index (CMI) occurred after hospitals switched to PPS. Based on Rand's preliminary findings, ProPAC staff estimated a 2.0 percent increase in reported case mix would occur during 1985. Of this increase, 0.8 percent was attributed to real case-mix changes. This estimate reflected consideration of historical trends in real-case mix change, recent shifts to outpatient treatment, and case-mix changes within DRGs not reflected in the case-mix index.

This year, the Commission has attempted to develop separate allowances for real case-mix changes due to changes in the distribution of DRGs (DRG case-mix index) and changes within DRG categories (patient complexity).

In the preliminary Rand study referenced above, substantial increases in the CMI were found during the quarter in which hospitals first come under PPS. Rand also reported that "DRGs with weights larger than average contribute positively to explaining the CMI increase by increasing their share of Medicare discharges. DRGs with weights smaller than average contribute positively to explaining the CMI increase by decreasing their share of Medicare discharges."[6] In analyzing shifts associated with PPS in pairs of DRGs that differ only by the age of the patient and the presence or absence of complications and comorbidities (CCs), Rand found that 100 out of 107 pairs had shifts toward the DRG with the higher weight. Based on this finding, the study concluded that " there is strong evidence that coding changes have contributed to the increase in the CMI."[7]

In a follow-up to its earlier study, Rand reported that CMI increases appear to have ended with the October 1984 quarter.[8] These recent findings indicate that increases in case mix index are leveling off and that the effect of PPS incentives to improve coding may be a one time phenomenon.

Nevertheless, the Commission believes that while changes in the DRG case-mix index may have leveled off, it is consistent with recent ex-

[5]The Medicare Case Mix Index Increase: Medical Practice Changes, Aging, and DRG Creep, The Rand Corporation, R-3292-HCFA, June 1985.

[6]Ibid., p. 30.

[7]Ibid., p. 34.

[8]The Medicare Case Mix Index Increase: Medical Practice Changes, Aging, and DRG Creep. Grace Carter and Paul Ginsburg, November 1985. HCFA Agreement 18-C-98489, p. 21.

perience to expect a small increase due to more accurate coding as hospitals continue to adjust to PPS and as hospitals in formerly waivered states (i.e., New York and Massachusetts) are brought into PPS for the first time. Consequently, for this report, the Commission has incorporated a one percent reduction in the DRG weights to account for observed changes in the DRG case-mix index during fiscal year 1986. Based on historical trends, we estimate that of this increase, 0.2 percentage points are due to real changes in DRG case mix.

These figures may change as more recent data are reported. Currently, no data on DRG case-mix change for fiscal year 1986 are available. It appears that HCFA will seek to update this study with additional data as claims from third quarter 1985 are received and processed.

The Rand studies do not directly address changes in the mix of patients within DRGs. However, the earlier Rand study (June 1985) concluded that although aging of the Medicare population did not contribute to the increase in the mix of patients among the DRGs, aging may contribute to an increase within DRGs.

Evidence on changes in the DRG case-mix index and patient complexity is being gathered by the Commission through a contract with the Commission on Professional and Hospital Activities (CPHA) to study approaches to measurement of case-mix changes.

This study uses medical record discharge abstract data on Medicare and non-Medicare discharges. Data are available from 1980 to 1984 and are to be updated in the next few months through 1985. Components of this project include efforts to determine measurement of changes in case mix as well as measurement of changes in case complexity. The data, while based on a self-selected sample of hospitals, provide information to assess case-mix changes over time. The reporting requirements concerning the numbers of diagnoses and procedures recorded on the medical abstract have not changed during this time period, an important reliability component reflected in neither the Medicare MEDPAR or PATBILL data.

Case or patient complexity is defined by the Body Systems Count approach developed by CPHA. The body systems measure is determined by developing a score for each patient based on the number of unique Major Diagnostic Categories (MDCs) reflected in the diagnoses recorded on abstracts for each patient stay. MDCs are groups of diagnoses that are broadly related to one another by the major body system (e.g., digestive system) under which diagnoses are categorized by the DRG system. The assumption is that patients with a higher number of MDCs are sicker, and more expensive to treat.

Patients can receive complexity scores ranging from 1 to 5, with 1 representing one diagnosis related to one MDC and 5 representing diagnoses in five or more separate MDC categories. If a patient has two diagnoses within the same MDC, the patient would be assigned a complexity score of one.

Based on the CPHA study, the Commission estimates a 0.7 percent increase in patient complexity during fiscal year 1986. This estimate is the best reflection of historical trends in length of stay associated with patient complexity changes that occurred in the two year period prior to implementation of TEFRA. In that period, Medicare and non-Medicare patients experienced approximately the same rate of increase in length of stay associated with increased complexity. During the period 1982-83, significant increases in length of stay associated with greater complexity were found for both populations, but the increase was substantially greater for the Medicare patients. During 1984, length of stay related to complexity decreased relative to 1983, but have not decreased to the level of the pre-TEFRA period. The Commission has assumed that the increase during the period 1982-84 was highly subject to the influence of improved hospital coding practices and may not represent actual changes in complexity. Thus the Commission has chosen to base its estimate of real complexity change on the experience of hospitals prior to 1983. The Commission has also assumed that a 0.7 percent increase in length of stay associated with increased complexity would translate into a 0.7 percent increase in costs. These estimates are subject to revision later in the year when data for 1985 will be available from CPHA.

Other Considerations—Trends in Hospital Operating Margins

Hospital operating margins are one of the most accepted "bottom-line" indicators of the financial health of the hospital industry. Operating margins represent the difference between a hospital's revenues and its expenses divided by its revenues, or the percent of revenues retained by the hospital. Patient margins refer to the margins generated from patient care services, whereas total margins relate to all sources of revenues and expenses.

According to data from the AHA's Hospital Panel Survey, average national patient margins were negative until 1980. Since that time, these margins have been positive and increasing, 0.7 percent in 1982 to 1.0 percent in 1983 and 2.0 percent in 1984. Patient margins declined slightly in the first 10 months of 1985 to 1.5 percent.

Despite dramatic declines in admissions and lengths of stay over the past 2 to 3 years, hospitals, in the aggregate, have been able to increase their patient margins in the face of increasingly constrained inpatient payments. In part, these increases could be attributed to hospitals achieving greater efficiency. These efficiencies may partially reflect the hospital industry's ability to realize a profit for the first time under the Medicare program. In part, however, increased margins are also attributable to the unintended impact of the transition that resulted in PPS payments being higher than expected.

Moreover, beyond the unintended impact of the transition, interpretation of these operating margin data requires caution. First, they reflect operating margins earned on both inpatient and outpatient services.

Second, these data reflect the experience of hospitals during the early stages of the transition when only a fraction of the hospitals' payments were subject to federal payment rates, and generous provisions were in force for teaching institutions. These data provide little insight into the financial condition of hospitals under fully implemented national PPS payment rates or under all-inclusive rates encompassing capital and operating costs.

Third, and perhaps most important, overall patient margins reflect the experience of hospitals in the aggregate, they do not reflect the distribution of these margins among various types of hospitals and sources of funding (e.g., teaching versus non-teaching hospitals, Medicare versus private pay patients).

Evidence from the AHA's National Hospital Panel Survey and Annual Survey indicates significant variation in patient margins among various types of hospitals. For example, recent 1985 data from the Panel Survey indicates that hospitals with less than 50 beds or more than 300 beds continue to experience very small or negative patient margins (e.g., −12.4 percent for hospitals with less than 25 beds, 0.4 percent for hospitals with 500 beds or more). Margins vary significantly by region of the country, ranging from −2.6 percent for the Mid-Atlantic states to 4.0 percent for states in the Pacific region. In 1984, 28.9 percent of the nation's rural hospitals experienced a patient margin deficit of over 6 percent compared to 14 percent of urban hospitals.

Despite the above cautions, these data do provide an indication that payment levels established under PPS have provided sufficient funds for hospitals, in the aggregate, to generate positive patient margins that, in turn, can be used to acquire new technologies, to maintain and perhaps improve the quality of care provided, or to set aside funds for future investments.

ISSUES AND APPROACHES TO THE DEVELOPMENT OF A DISCRETIONARY ADJUSTMENT FACTOR (DAF) FOR PPS-EXCLUDED HOSPITALS[9]

The statute establishing the Medicare prospective payment system (PPS) created two broad classes of hospitals—those that would be paid on the basis of DRGs and those that would not. For those that would not be part of the DRG-based system—psychiatric, rehabilitation, pediatric, and hospitals with unusually long average lengths of stay—payment is based on actual cost experience capped by a ceiling established by trending forward the facility's average cost per discharge.

As the Prospective Payment Assessment Commission (ProPAC) has conducted its analysis of the appropriate levels for the hospital market basket and Discretionary Adjustment Factor (DAF), the question has arisen whether the same Discretionary Adjustment Factor should be applied to both the hospitals paid on the basis of DRGs (PPS hospitals) and the excluded hospitals.

In brief, empirical and anecdotal evidence indicate that there are sufficient differences between PPS hospitals and the excluded hospitals to justify development of a separate DAF for the excluded hospitals. The evidence suggests that a somewhat lower technology factor for some excluded hospitals would be appropriate as well as a lower offset for productivity. The evidence does not support an offset for product change. Anecdotal evidence suggests that some excluded hospitals are experiencing increases in case mix, but there are currently insufficient data to quantify these changes.

Key Differences Between PPS and Excluded Hospitals

Labor Intensity

Compared with the PPS hospitals, psychiatric hospitals, rehabilitation hospitals, and long-term care hospitals are all more labor and less capital intensive. Their product is much more a function of the direct delivery of services by nurses, therapists, and others (pediatric hospitals have a similar labor and capital mix to PPS hospitals). These differences have implications not only for the market basket component of the update factor but for the Discretionary Adjustment Factor as well. In particular, the labor intensive character of these institutions affects the potential for technological change and productivity improvements.

Place in the Continuum of Care

Under PPS, community hospitals are given incentives to improve the efficiency of care by providing care in outpatient settings or transferring patients to other settings, where appropriate. Excluded hospitals, however, are more likely to receive transfers from other facilities, less likely to have opportunities for outpatient preadmission procedures (pediatric hospitals may be a partial exception to this), and in some cases such as psychiatric care, may have more difficulty identifying sources of post-hospital care for patients.

Hospital-Specific Reimbursement

The PPS is based on the use of national or regional averages as the basis for "pricing" of services. Hospitals below these averages receive payments over their costs; hospitals above are penalized. The rates for services paid to the excluded hospitals, however, are hospital-specific. While this can help take into account legitimate differences in costs due to case mix and other factors, it also has the consequence that hospitals which have previously reduced costs have lower rates and thus fewer opportunities for further cost reduction.

Treatment of Case-Mix Changes

The DRG system automatically pays for changes in DRG mix. Under cost-based reimbursement for excluded hospitals, however, there is no payment for changes in case mix. Therefore, the excluded hospitals have no obvious incentives to change

[9]This section is excerpted from an Executive Summary of a study by Lewin and Associates, Inc., Washington, D.C., for the Prospective Payment Assessment Commission under contract number T-33727295.

coding practices. HCFA has argued that excluded hospitals are protected from adverse effects of increasing case mix through the exceptions process. It should be noted, however, that the exceptions process is extremely cumbersome and provides only retroactive relief (if granted), typically more than two years after the excess costs have been incurred.

In examining issues regarding the Discretionary Adjustment Factor, however, it is necessary to consider whether diagnostic mix or case severity are likely to have changed in excluded hospitals and, if possible, to make adjustments to avoid penalizing hospitals serving patients who require more resources or providing windfalls to hospitals treating more low-resource patients.

Interpretation of Length-of-Stay Changes

In developing the Discretionary Adjustment Factor for PPS hospitals, length-of-stay changes have been used as a measure of product/productivity change. In the excluded hospitals, because changes in diagnostic mix cannot be factored out, interpretation of length-of-stay changes are more ambiguous.

Strength of the Incentives

The DRG system allows hospitals which have costs lower than payments to retain the full savings. In the excluded hospitals, the maximum profit allowed is the lower of either half the savings or five percent of the target rate, whichever is less. There is, therefore, less overall incentive for aggressive cost reducing behavior.

Psychiatric Hospitals/Units

In June of 1985, 464 psychiatric hospitals and 762 distinct-part units had been granted exclusions to PPS. This class of hospitals received approximately $287 million in 1984, 0.71 percent of all Medicare expenditures. Medicare expenditures as a portion of total revenue is lowest in nonpublic psychiatric hospitals and estimated at about 12 percent. Distinct-part units are estimated to have a somewhat higher portion of total revenue from Medicare than nonpublic psychiatric hospitals. Public psychiatric hospitals have widely varying dependence on Medicare revenues. Wide variations in treatment modalities and practice patterns between hospitals make general conclusions regarding case mix, productivity, and product changes difficult to draw.

Case Mix

Researchers have had little success to date in developing measures for psychiatric hospitals which reliably predict resource use. Anecdotal information suggests that psychiatric hospitals believe they are getting more "acutely ill" patients now, but currently available information is inadequate to make any but tentative judgments about case-mix severity.

Product Change/Productivity

A product change for psychiatric hospitals/units means discharging people who were formerly treated in the hospital to other settings where additional care is provided. There is no empirical evidence, but some industry officials state that they have witnessed increased "dumping" of difficult cases by acute hospital psychiatric units.

Productivity changes, as ProPAC uses this term, contrast with product changes in that they reflect changes in the use of resources (e.g., ancillary services, staff, and length of stay) without changes in the product.

Trend data from the American Hospital Association (AHA) show that the average length-of-stay declined nearly 10 percent between 1983 and 1984, over twice the reduction (-3.57 percent) observed in general hospitals. This reflects an acceleration of a trend in psychiatric hospitals which began with the deinstitutionalization movement in the 1960s, continued at a slower pace up to 1980, and has increased from that period to the present (see Table A-15).

Reductions in length-of-stay have been accompanied by reductions in FTEs. These reductions have not kept pace with reductions in patient load. Nevertheless, compared to general community hospitals, psychiatric hospitals have achieved greater productivity gains by reducing FTEs per admission in recent years. We must caution that some of the difference between acute and psychiatric hospitals may reflect different reporting practices.

Table A-15.—Non-Federal Psychiatric Hospitals (NFP)

Year	FTE's Percent Change		Admissions Percent Change		FTE/ Admission Percent Change		Admission/ FTE Percent Change		Patient Days Percent Change		FTE/ Patient Day % Change		ALOS (All Patients)		ALOS Percent Change	
	NFP	PPS	NFP	PPS	NFP	PPS	NFP	PPS	NFP	PPS	NFP	PPS	NFP	PPS	NFP	PPS
1970	0.66	5.75	5.84	3.53	−4.14	2.01	5.15	−2.11	−8.78	1.69	10.33	4.00	272.8	8.26	−13.84	−1.78
1971	−6.56	3.63	0.67	3.04	−7.25	0.61	7.70	−0.57	−12.08	0.45	6.31	3.17	238.3	8.05	−12.65	−2.54
1972	7.72	2.85	−2.82	2.11	10.99	0.75	−9.75	−0.72	−3.55	−0.01	11.68	3.00	236.5	7.88	−0.76	−2.11
1973	−1.30	4.52	0.51	3.20	−1.91	1.35	1.84	−1.27	−9.77	2.56	9.37	1.92	212.3	7.83	−10.23	−0.63
1974	1.65	6.52	1.19	3.72	0.58	2.66	−0.46	−2.62	−10.23	2.94	13.27	3.47	188.3	7.77	−11.31	−0.77
1975	−5.20	4.81	1.51	1.75	−6.76	0.0	7.09	−2.92	−13.68	1.00	9.82	3.77	160.1	7.71	−14.98	−0.77
1976	−2.40	3.50	−0.99	1.64	−1.24	4.89	1.40	−1.80	−12.21	0.99	12.46	2.49	140.4	7.66	−12.31	−0.65
1977	0.70	3.95	−1.84	0.84	2.52	3.02	−2.53	−3.00	−8.26	0.28	9.78	3.66	131.2	7.62	−6.55	−0.52
1978	−3.14	3.14	−1.19	0.65	−2.05	2.53	2.01	−2.42	−9.71	0.42	7.27	2.71	119.9	7.60	−8.61	−0.26
1979	1.44	3.76	−2.24	1.69	3.76	2.08	−3.60	−1.99	−1.85	1.25	3.35	2.48	120.4	7.57	0.42	−0.39
1980	−2.48	4.24	−0.18	2.95	−2.21	1.15	2.34	−1.23	−1.87	2.61	−0.63	1.59	118.3	7.54	−1.74	−0.40
1981	0.0	5.56	−1.41	0.82	1.44	4.78	−1.41	−4.49	−5.18	2.14	5.46	3.35	113.8	7.64	−3.81	1.33
1982	0.73	2.34	1.79	−0.18	−1.01	2.52	1.08	−2.46	−3.45	−0.13	4.32	2.47	108.0	7.65	−5.10	0.13
1983	−4.69	−0.26	−2.82	−0.63	−2.05	0.35	1.95	−0.37	−4.76	−1.70	0.09	1.48	105.8	7.56	−2.04	−1.18
1984	−1.52	−2.55	4.71	−2.76	−5.86	0.23	6.31	−0.22	−5.37	−6.27	4.07	3.96	95.6	7.29	−9.64	−3.57
Average Percent Change Per Year:																
	−0.96	3.45	0.18	1.49	−1.01	1.93	1.28	−1.88	−7.38	0.55	7.13	2.90			−7.54	−0.94
Average Annual Compounded Change Per Year:																
	−1.02	3.43	0.15	1.48	−1.11	1.92	1.18	−1.89	−7.47	0.52	7.05	2.90			−7.68	−0.95

Notes:
1. Inpatient Days were calculated as follows: Average Daily Census (ADC) × 365.
2. ALOS was calculated as follows: Inpatient Days ÷ Admissions.
3. PPS hospitals are hospitals which are classified in the AHA survey as non-Federal, short-term general and other special hospitals.
4. Average annual compounded change per year represents the geometric mean change that occurred over the time period.

SOURCE: FTE, Admissions, and Inpatient Days are based on data from the American Hospital Association Annual Survey of Hospitals.

In summary, it appears that product/productivity changes in the psychiatric field are likely to be substantially different from PPS hospitals, but there is insufficient data to precisely quantify those differences. Comparisons of length-of-stay and FTEs suggests that in the past year, changes in case mix, product, and productivity have been greater in psychiatric hospitals than PPS hospitals.

Technology and Treatment

Historically, the principal forms of quality-enhancement in the psychiatric field have involved drugs and service organizations. The frontiers of psychiatry and psychopharmacology now increasingly involve the use of sophisticated and costly diagnostic tools such as PET scans and Magnetic Resonance Imaging. The number of patients for whom such technologies are important has not, to our knowledge, been estimated. From extensive discussions with experts, it is our sense that the appropriate allowance for Technology/Treatment should be somewhat less for psychiatric hospitals than for PPS hospitals.

Rehabilitation Hospitals/Units

The principal exclusion criteria of these facilities are: 1) at least 75 percent of inpatient treatments must involve one or more of 10 categories (such as stroke, burns, etc.); 2) 24-hour specialized physician and nursing care must be available; and, 3) three hours per day must be devoted to physical or occupational therapy. Additionally, active patient screening and appropriateness of rehabilitative care reviews are important to maintaining exclusion status.

As of fiscal year 1985, there were 63 rehabilitative hospitals and 373 distinct-part units. New requests for distinct-part units have more than doubled the number of excluded units between fiscal years 1984 and 1985. As a group, these hospitals and units received approximately $43 million in 1984, which was 0.11 percent of total Medicare expenditures. However, in contrast to the other excluded classes of providers, Medicare payments comprised between 40 and 50 percent of their total patient revenues. For this reason, the impact of even small PPS changes may have a large effect on treatment in these facilities.

Most patients (80 percent) in rehabilitation hospitals/units come directly from an acute care hospital. The strong incentives of PPS to move patients out of acute care sooner, combined with the potential for additional per-diem revenues if they are moved to an attached excluded unit, raise concerns about how rehabilitation units may be used. It is likely that these reimbursement incentives may be the strongest force driving changes in case-mix and costs for these facilities.

A study recently completed by Rand found wide variations between facilities in lengths-of-stay, even after controlling for case-mix and relevant variables such as teaching status. While the data were not conclusive, the researchers hypothesized that proximity to an acute care hospital was an important factor in observed differences.

Case Mix

There are no long-term historical trend data on case mix for these facilities. Respondents to a membership survey conducted by the California Association of Rehabilitation Facilities reported that the level of severity of patients had increased. They also reported an increase in the number of "inappropriate referrals," particularly patients too sick to benefit from physical therapy and other rehabilitative services.

Responsibility for monitoring the appropriate transfer of Medicare patients into rehabilitation facilities lies with the PROs which must approve Medicare payment for each claim. There are reports that PROs vary in how they interpret the coverage criteria, particularly the requirement that patients must need three hours per day of physical or occupational therapy. Where the PROs apply the criteria stringently, the case mix of rehabilitation facilities will increase; where the PROs are less stringent, case mix will decrease.

Since the PROs are under considerable pressure to reduce "unnecessary" use of services, we can confidently predict that the complexity and severity of patient illness in these facilities will increase. At present, however, there are not data suitable for estimating the degree to which case mix is intensifying.

Product/Productivity

We believe that excluded hospital rehabilitation facilities are likely to be very different from traditional rehabilitation facilities. Moreover, we are concerned that the available AHA data on rehabilitation facilities may not provide an accurate picture of the excluded facilities. For example, the average length-of-stay for all rehabilitation facilities reported in the AHA Annual Survey was 43.2 days in 1984 (see Table A-16). Coopers and Lybrand data, however, report an average length-of-stay of 34.1 days, and the Hospital Utilization Project (HUP) reports an average length of stay (ALOS) ranging from 31.9 days in the West to 39 days in the South.

Moreover, AHA data on labor trends are likely not to be applicable to excluded rehabilitation facilities for two reasons. First, AHA data on employment exclude contract workers, and a relatively large proportion of employees, particularly physical and occupational therapists, are contracted. Thus, the declining number of FTEs/patient day observable in the AHA data cannot be assumed to reflect increased productivity. It is as likely that these numbers reflect greater reliance on contracted services.

Second, the service intensity of the excluded hospitals is very much a function of Medicare requirements. For reasons discussed above, we have insufficient evidence on which to base even tentative conclusions regarding this component.

Technology

Cost-increasing, quality-enhancing technologies in rehabilitation involve both equipment and labor. Because much of the service intensity of this industry is prescribed by Medicare, and because the occupational structure differs so substantially from that of acute care hospitals (making the market basket less reliable for this sector), approaches for analyzing trends in technology (e.g., observing changes in net intensity) may not be applicable. Thus, we do not currently have reliable information regarding historical changes among rehabilitation facilities. Since service intensity is largely prescribed by Medicare and since equipment is reimbursed separately, we currently believe that, on balance, a somewhat lower technology add-on than is applied to PPS hospitals may be appropriate.

Children's Hospitals

The principal exclusion criteria for children's hospitals is that the predominant number of inpatients be under 18 years of age. The children's hospitals were initially excluded from PPS due to lack of data. Children's hospitals are likely to be included in PPS relatively soon since pediatric DRGs that explain a substantial proportion of resource use appear feasible and are being developed. As of June 30, 1985, 49 children's hospitals were excluded. Medicare payments to these hospitals were only $9 million and accounted for less than 0.02 percent of the Medicare expenditures. Thus, Medicare revenue as a percentage of total revenues in children's hospitals is extremely small. For this reason, it is unlikely that the existing freeze in the target rate ceiling increase for these hospitals or adjustments in the components of the Discretionary Adjustment Factor would have any appreciable effect on their behavior.

Although there is no trend data available on case mix in children's hospitals, industry observers do not expect substantial changes. These hospitals already serve as referral centers for the sickest children (particularly newborns).

Product change, as defined by ProPAC, is less an issue with children's hospitals than PPS hospitals. At present, there is less pressure on children's hospitals than on PPS hospitals to reduce length-of-stay or to substitute alternative services. Pediatric home care, for example, is largely unavailable and is paid for by Medicare and Medicaid only in a very limited number of circumstances.

In addition, possible product changes reflecting the move to outpatient surgeries may already have occurred. While same-day or outpatient surgery does continue to increase, the relevant operations are not common among children (e.g., cataracts) and, where common (e.g., tonsillectomies), are declining overall. Finally, children are rarely transferred to nursing homes, making substitution of these services for the last few days of an acute stay an inconsequential product change possibility in this sector.

Table A-16.—Non Federal Rehabilitation Hospitals (NFR)

Year	FTE's Percent Change		Admissions Percent Change		FTE/ Admission Percent Change		Admission/ FTE Percent Change		Patient Days Percent Change		FTE/ Patient Day % Change		ALOS (All Patients)		ALOS Percent Change	
	NFR	PPS	NFR	PPS	NFR	PPS	NFR	PPS	NFR	PPS	NFR	PPS	NFR	PPS	NFR	PPS
1970	2.20	5.75	8.30	3.53	−5.71	2.01	5.96	−2.11	−4.27	1.69	6.77	4.00	64.60	8.26	−11.62	−1.78
1971	5.51	3.63	38.35	3.04	−23.54	0.61	31.12	−0.57	3.71	0.45	4.21	3.17	48.43	8.05	−25.03	−2.54
1972	32.00	2.85	35.02	2.11	−2.35	0.75	2.32	−0.72	35.92	−0.01	−5.21	3.00	48.76	7.88	0.68	−2.11
1973	4.39	4.52	1.96	3.20	2.40	1.35	−2.33	−1.27	5.27	2.56	−0.82	1.92	50.34	7.83	3.24	−0.63
1974	5.28	6.52	20.25	3.72	−12.61	2.66	14.21	−2.62	−1.35	2.94	6.72	3.47	41.30	7.77	−17.96	−0.77
1975	4.97	4.81	−11.17	1.75	18.46	0.0	−15.37	−2.92	7.87	1.00	−2.70	3.77	50.15	7.71	21.43	−0.77
1976	0.45	3.50	0.03	1.64	0.28	4.89	−0.42	−1.80	1.15	0.99	−0.68	2.49	50.71	7.66	1.12	−0.65
1977	10.22	3.95	10.46	0.84	−0.28	3.02	0.21	−3.00	4.71	0.28	5.26	3.66	48.07	7.62	−5.21	−0.52
1978	6.18	3.14	−5.54	0.65	6.52	2.53	−6.11	−2.42	−10.99	0.42	13.04	2.71	45.30	7.60	−5.76	−0.26
1979	−2.69	3.76	−6.74	1.69	4.52	2.08	−4.18	−1.99	−3.71	1.25	1.06	2.48	46.77	7.57	3.25	−0.39
1980	−1.18	4.24	−1.00	2.95	0.25	1.15	0.20	−1.23	−2.52	2.61	1.38	1.59	46.04	7.54	−1.56	−0.40
1981	12.88	5.56	2.19	0.82	10.46	4.78	−9.44	−4.49	7.59	2.14	4.91	3.35	48.47	7.64	5.28	1.33
1982	9.16	2.34	8.74	−0.18	0.46	2.52	−0.39	−2.46	2.90	−0.13	6.08	2.47	45.87	7.65	−5.36	0.13
1983	−4.97	−0.26	9.41	−0.63	−13.33	0.35	15.12	−0.37	−2.31	−1.70	−2.73	1.48	40.96	7.56	−10.70	−1.18
1984	6.32	−2.55	2.93	−2.76	3.45	0.23	−3.17	−0.22	10.39	−6.27	−3.83	3.96	43.99	7.29	7.40	−3.57
Average Percent Change Per Year:																
	6.05	3.45	7.55	1.49	−0.74	1.93	1.85	−1.88	3.62	0.55	2.23	2.90			−2.72	−0.94
Average Annual Compounded Change Per Year:																
	−5.74	3.43	6.73	1.48	−1.25	1.92	1.30	−1.89	3.17	0.52	2.12	2.90			−3.33	−0.95

Notes:
1. Inpatient Days were calculated as follows: Average Daily Census (ADC) × 365.
2. ALOS was calculated as follows: Inpatient Days ÷ Admissions.
3. PPS hospitals are hospitals which are classified in the AHA survey as non-Federal, short-term general and other special hospitals.
4. The ALOS for the rehabilitation facilities is significantly larger than that seen in the literature. This is due in part to the inclusion of rehabilitation hospitals which may more appropriately be considered long-term care facilities in the AHA survey data.
5. Average annual compounded change per year represents the geometric mean change that occurred over the time period.

SOURCE: FTE, Admissions, and Inpatient Days are based on data from the American Hospital Association Annual Survey of Hospitals.

We have no information at present with regard to technology changes or (as a proxy) changes in net intensity. However, industry officials report that changes in children's hospitals should be similar to those in PPS hospitals. The principal difference is that because the population of children's hospitals is, on average, sicker and more costly to care for than that of other hospitals, sophisticated equipment and services developed for the most complex cases may be required more often in children's hospitals.

Because Medicare is such a small factor in children's hospitals and because current evidence suggests fewer substantial differences between these excluded hospitals and the PPS sector than for other excluded hospitals, it is probably not necessary to create a separate Discretionary Adjustment Factor component.

Long-Term Care (Chronic) Hospitals

The principal criterion for long-term care hospitals excluded from PPS is that average inpatient length-of-stay exceed 25 days. Under this criterion, 88 hospitals have been granted exclusions. In 1984, these hospitals received approximately $273 million and accounted for about 0.68 percent of all Medicare expenditures. At least 30 percent would likely also qualify for exclusion under one of the three other classes of hospitals. Because this category comprises a very diverse group of hospitals, psychiatric, rehabilitative, children's, and others, grouping these hospitals together to estimate trends does not seem appropriate.

Because of long lengths-of-stay in these hospitals, many patients exhaust their Medicare eligibility during their stays. The result is that the largest portion of the revenues for these hospitals is from Medicaid. Thus, like children's hospitals, the relative sensitivity of these hospitals to changes in the Discretionary Adjustment Factor can be very small. However, many of the considerations that apply to the other classes of excluded hospitals are relevant to the long-term care hospitals.

According to industry observers, case-mix complexity is expected to increase for these facilities. As PPS creates pressures to reduce ALOS for acute patients or outlier payments are perceived as insufficient for the care of certain patients, more acutely ill, long-stay patients are being discharged to LTC facilities.

Technology changes in nursing homes, which might be similar to some of the excluded long-term care hospitals, have generally involved changes in staffing patterns. According to HCFA studies of the nursing home industry between 1971 and 1981, the compounded annual average change in net service intensity increased by 0.95 percent per year, considerably less than the 3.3 percent increase in net intensity for general hospitals.

The available information indicates that these hospitals differ greatly from PPS hospitals. Because of the great variation within this group, quantification of the Discretionary Adjustment Factor components is difficult. The evidence, however, supports at least some type of adjustment for increasing case complexity that may be occurring in LTC facilities.

BACKGROUND ON RECALCULATING AND REBASING THE STANDARDIZED AMOUNTS

In its recommendations for the fiscal year 1986 payment amounts, the Commission made recommendations regarding recalculating the standardized amounts. Recognizing that a lack of suitable data made rebasing for fiscal year 1986 impossible, the Commission recommended that the Secretary implement a process for timely collection of the cost data needed to recalculate the standardized amounts in the future. In the accompanying discussion, the Commission indicated its intent to make future recommendations regarding the data used to recalculate possible adjustments to the calculation (such as setting a limit on how much the standardized amounts could change as a result of rebasing), and the frequency and timing of recalculation.

Recalculating and Rebasing the Standardized Amounts

Once the standardized amounts are recalculated, the results could be used in two ways. Recalculated standardized amounts could be one piece of information used to select an update factor. Alternatively, the standardized amounts could be rebased, that is, the recalculated amounts could be updated and substituted for the current published rates.

If the decision is made to rebase the standardized amounts, several other choices must be made. These include the frequency of rebasing and the possibility of setting a limit on how much effect rebasing could have on the standardized amounts. A further choice is the method for averaging the standardized amounts, which could have important effects on the distribution of payments to hospitals.

Frequency and Timing of Rebasing

A number of factors could be considered in developing a schedule for rebasing the standardized amounts.

The Relationship Between Rebasing and the Update Factor

Determining the frequency and timing of rebasing involves a judgment about how long cumulative update factors can be expected to reflect changes in hospital costs. A goal expressed during the Commission's deliberations over the update factor recommendation for fiscal year 1986 was that the the updated standardized amounts should be close to what they would be if the data were available to rebase them. In this way, a relatively close relationship would be maintained between hospital costs—given the incentives under PPS—and the payment amounts.

The Possible Effects of Rebasing on PPS Incentives

Another consideration is the possible effect of rebasing on hospital behavior. Some have argued that frequent rebasing would limit the cost-reducing incentives of PPS, since any profits hospitals gained through lower costs would be taken away by rebasing. Others point out that even if there was annual rebasing, individual hospitals would always have the incentive to lower costs, but that in planning a rebasing schedule, consideration should be given to how long the industry should share in the gains from lower costs.

The Timing of Other Major Changes in PPS

Another possible factor to consider in developing a rebasing schedule is the timing of other major changes in the PPS, such as the addition of capital to the PPS rates.

Process for Rebasing and Adjustments to the Recalculated Standardized Amounts

A number of methods could be used to rebase the standardized amounts. One approach would simply take new data, calculate the average cost

per discharge for the appropriate regional and national hospital groups, update them to the payment year, and use the updated recalculations as the new standardized amounts.

Alternatively, the recalculated amounts could be adjusted before they are used in payment. For example, if the previous update factors did not completely reflect changes in hospital costs, the newly calculated amounts could be very different from the current standardized amounts. In order to avoid large swings in the payment rates, a limit on how much any of the standardized amounts could change in a given year as a result of rebasing could be determined in advance. A long-run schedule might be developed so that if the recalculation calls for an unforeseen dramatic change in standardized amounts, the adjustment to the new payment level is phased-in over the years until the next scheduled rebasing.

In this way, if errors were made in developing the update factor because inflation was measured inaccurately or because the DAF allowances were inappropriate, neither the industry or the government would face a major change in payments in one year. Choosing a pre-determined limit on changes in the standardized amounts due to rebasing may also allow the industry to retain some of the profits from lower costs. This would mitigate the possible negative effects of rebasing on PPS incentives to lower costs. Choosing these annual limits would be somewhat arbitrary, however, and would favor gradual change at the short-term expense of accurate payment rates.

If the transition to completely federal payment amounts is slowed, the decision of whether to rebase the hospital specific amounts would have to be made. Even if the transition proceeds, rebasing the hospital-specific amounts might be considered for the roughly 300 Sole Community Hospitals. The statute requires that these hospitals be paid indefinitely using the blend of the first year of the transition (75 percent hospital-specific and 25 percent regional).

On the one hand, rebasing the hospital specific amounts would make this part of the payment reflect the hospital's own costs more currently than the updated base year rate that is now in use. On the other hand, it can be argued that rebasing the hospital-specific amounts would penalize those hospitals that have responded most to PPS incentives for lower costs.

Alternative Methods for Averaging the Standardized Amounts

Another possible consideration in developing an approach for rebasing is the method of averaging the standardized amounts. The original method used an unweighted average for each payment group (the twenty regional and national urban and rural groups). That is, the average cost per discharge for each hospital was summed, then divided by the number of hospitals. The resulting average is not the average cost of treating a Medicare case for that group, but a simple average of each hospital's average cost per discharge. A hospital with a few Medicare discharges has the same weight in determining the standardized amount as a hospital with many Medicare discharges.

The original averaging approach—termed "hospital weighting"—produces lower standardized amounts than a case-weighted average would. Larger hospitals tend to have more Medicare discharges and also higher per-case costs. As a result, a case-weighted average, which gives more weight to larger hospitals, would generate a higher group average. (This process did not affect total payments initially, since the budget neutrality requirement would simply have scaled the higher standardized amounts to the same aggregate payment level. Some differences in the relative size of the standardized amounts among the Census divisions probably resulted, however.)

An alternative would be to use "discharge-weighting" to compute the standardized amounts. Under this approach, each hospital's cost per case would first be multiplied by its total Medicare discharges, then summed and divided by the total number of Medicare discharges for the payment group. Hospitals with a greater share of Medicare discharges would have more influence on the resulting standardized amount than hospitals with relatively few Medicare cases.

The argument made in favor of the current hospital-weighting method is that PPS is intended to

change behavior at the hospital level, not the discharge level. Therefore, once differences in the area wage index, teaching adjustment and case mix are taken into account, each hospital should be able to attain the cost of the average hospital. Alternatively, the rationale for discharge-weighting is that because PPS payment is made on a per-case basis, the standardized amount should represent the average cost of treating a case, not the cost of the average hospital.

The distribution of PPS payments is significantly affected by the choice between discharge-weighting and hospital-weighting the standardized amounts. Table A-17 shows the difference between the hospital-weighted standardized amounts as published for fiscal year 1985 and discharge weighted amounts based on the same data. The case-weighted amounts were adjusted so that payments using them would be the same as payments using the hospital-weighted amounts.

The major underlying distributional difference between the averaging methods is that under discharge-weighting, rural hospitals would gain relative to urban hospitals.[10] After taking into account "budget neutrality," discharge-weighting would increase the national standardized amount for rural hospitals by about 3 percent. To pay for this increase, which under fully national rates would be about $190 million in fiscal year 1986 dollars, the standardized amounts for urban hospitals would be about 0.5 percent lower. Case weighting would thus remove about $90, or 15 percent of the $604 difference between the urban and rural standardized amounts.[11]

If the regional amounts were discharge-weighted, the results would vary across the Census divisions.

Table A-17.—Comparison Of Hospital-Weighted And Estimated Discharge-Weighted Standardized Amounts For Fiscal Year 1985[a]

	Hospital Weighted (Published)	Discharge Weighted	Percent Difference
Rural Groups:			
National	$2,381.39	$2,455.21	3.1
New England	2,605.26	2,722.50	4.5
Middle Atlantic	2,600.61	2,519.99	−3.1
South Atlantic	2,316.89	2,384.08	2.9
East North Central	2,631.16	2,681.15	1.9
East South Central	2,305.91	2,368.17	2.7
West North Central	2,326.24	2,472.79	6.3
West South Central	2,244.09	2,280.00	1.6
Mountain	2,360.42	2,469.00	4.6
Pacific	2,520.98	2,558.79	1.5
Urban Groups:			
National	$2,985.05	$2,970.12	−0.5
New England	3,122.44	3,138.05	0.5
Middle Atlantic	2,866.65	2,846.58	−0.7
South Atlantic	2,909.23	2,856.86	−1.8
East North Central	3,164.68	3,117.21	−1.5
East South Central	2,630.36	2,688.23	2.2
West North Central	3,025.81	3,059.09	1.1
West South Central	2,847.86	2,870.64	0.8
Mountain	2,845.47	2,822.71	−0.8
Pacific	3,070.47	3,061.26	−0.3

[a]Amounts are sum of labor and nonlabor standardized amounts. Hospital-weighted amounts are those published for FY 85. Discharge-weighted amounts were calculated with the same data used to compute the published amounts, and were adjusted so that total payments would be the same using discharge-weighted and hospital-weighted averages.

SOURCE: ProPAC estimates based on the 1981 Medicare Cost Report data used to compute the standardized amounts.

The standardized amount for rural hospitals in the West North Central Census division would increase 6.3 percent. The urban area with the largest drop in payment would be the South Atlantic, where the standardized amount would drop by 1.8 percent.

Nationally, rural hospitals are more sensitive to the choice of an averaging method because the larger, higher cost hospitals tend to have a more dominant share of the discharges than in urban areas. This is probably because the large number of very small low-cost rural hospitals account for relatively few discharges. Seventy-seven percent of rural hospitals have less than 100 beds, but they treat less than half of all the Medicare discharges from rural hospitals. Under hospital-weighting, these small hospitals count as much in the average as the larger ones. The difference between hospital-weighted and discharge-weighted average amounts varies across regions depending on how

[10]In the Middle Atlantic rural region the discharge weighted average cost per case is higher than the hospital-weighted average because of the states involved. Only Pennsylvania and New York are included in this group. (Although New Jersey is in the Middle Atlantic region, there are no areas in New Jersey located outside an MSA.) The New York rural hospitals have much higher average costs, but have a smaller proportion of the discharges, than the Pennsylvania rural hospitals. When discharge-weighting is used, the low-cost Pennsylvania hospitals dominate the average. The hospital-weighted average is higher because the relatively high cost New York hospitals have more effect on the average.

[11]In FY 86, the standardized amounts reflect the use of a new area wage index. A comparison of hospital-weighted and discharge-weighted amounts using this new index would probably differ from this analysis. Preliminary results suggest the differences are not significant, however.

the distribution of hospitals compares to the distribution of discharges.

Table A-18 gives a further example of the difference between the distribution of hospitals and discharges in rural areas. In the Mountain rural region, the 222 hospitals (88 percent) with less than 100 beds treat only 64 percent of the cases. Their standardized costs per case are 20 percent lower than the average for the largest rural hospitals in the region. Under hospital-weighting, however, the low costs of these small hospitals dominate and the overall average is only 2 percent higher. Under discharge-weighting, the larger hospitals would have more effect on the average, which for the rural Mountain group is 4.6 percent higher than the hospital-weighted average after adjusting for "budget neutrality".

Representativeness of Speed Audit Sample[12]

We have examined the representativeness of the "speed audit" sample of hospitals as a subsample of the hospitals used to set prospective payment system rates. The speed audit sample of some 1,200 hospitals was drawn from the larger sample of hospitals by HCFA for purposes of estimating costs associated with capital expenditures, and for recalculating standard amounts. The hospitals were sampled disproportionately from all possible combinations of four Census regions and four bedsize groups. Because the sample is not a simple random sample of the PPS sample hospitals, there was some question of how representative these speed audit hospitals were of hospitals in general.

At ProPAC's request, we examined representativeness in terms of:

- all hospitals, without reference to any special geographic or bedsize reference,
- the sixteen strata used to construct the sample (four bedsize groups by four census regions),
- urban versus rural hospitals,
- urban versus rural hospitals for each of the nine census divisions, and
- hospitals weighted by the number of Medicare discharges.

For each of these alternatives, we estimated the sampling weights from the data, reweighted the observations to reflect their sampling weights, and compared the audit and non-audit samples to see if they differed over several characteristics. We found that the audit samples differed appreciably from the non-audit sample. Audit hospitals tended to be larger, more expensive, and urban. These differences were quite significant. Correcting for rural vs urban, Medicare discharges, or nine Census Division mix did not remove the imbalance in the sample. However, when we corrected for the sampling by Census region and bedsize groups, there were no significant or large differences between the audit and the non-audit sample.

In the following sections, we present the data and methods, and report the results of the representativeness analysis.

Data and Sample

For this analysis, we relied on data provided by the ProPAC staff, which they obtained from

[12]This section contains part of a study by Willard G. Manning of the Rand Corporation, Santa Monica, California for the Prospective Payment Assessment Commission under Purchase Order Number T337281898 February 1986. A number of statistical tables included in the Rand study are not presented in this appendix.

Table A-18.—Distributions Of Hospitals And Discharges In The Rural Mountain Region Payment Group, By Bed-Size Category

Bed-Size Category	Hospitals		Discharges		Average Standardized Cost Per Case
	Number	Percent	Number	Percent	
<100	222	88	90,556	64	$2,316.85
100-169	22	9	32,350	23	$2,626.77
169+	7	3	19,585	14	$2,904.79
Total	251		142,491		$2,360.42

SOURCE: ProPAC calculations from the 1981 Medicare Cost Report data used to compute the standardized amounts.

HCFA. The sample consists of the 5,501 hospitals which were used to calculate the PPS standardized amounts. A hospital was excluded if it was exempt from PPS or if its status was unknown. Of the hospitals with missing status, 51 were speed audit hospitals. These hospitals were also missing data on the major hospital characteristics. Six speed audit hospitals were excluded because they were exempt from PPS. This left a speed audit sample of 1,140.

Hospitals were labeled as being rural if they had a 1981 FIPS SMSA code of 9999. Some hospitals were missing data on hospital bedsize. Using data from the 1981 AHA files, we were able to replace all but nine cases. We grouped the hospitals into four bedsize groups, using a ProPAC supplied bedsize variable (BEDSI__PR) and the original HCFA groupings of 0-149, 150-299, 300-499, and 500+ beds. We used the ProPAC census division variable (CEN__DIV) to create the Census Region and Division groupings.

In addition to examining bedsize, geographical, and urban/rural differences between the audit and non-audit samples, we also looked at a number of other characteristics. These included type of control (e.g., proprietary versus nonprofit), SMSA size, the age of the clientele (Medicare discharges and proportion of cases paid by Medicare), the proportion of the admissions for Medicaid patients, case mix and case-mix adjusted cost per case, and several approval or accreditation measures.

Methods

To assess the representativeness of the speed audit sample, we first determined the probability that a hospital would be included in the audit sample for each of the sampling approaches mentioned above (e.g., rural, or four census by four bedsize groups). These probabilities were estimated directly, rather than being inferred from the sampling scheme originally used by HCFA. Second, each hospital was assigned a weight that was the inverse of its probability of being included in the audit sample if an audit hospital, and the inverse of its probability of being excluded if not an audit hospital. Third, using these population weights, we then compared the two samples to see if the reweighted data differed for the two samples.

The comparisons were made using analysis of variance techniques, with no adjustment for the fact that the weights were determined empirically. Such an adjustment would decrease the significance of the results presented here, but the adjustment should be small. In any event, none of the qualitative patterns presented below would probably be affected by such an adjustment.

For categorical variables, such as census division, we made comparisons of the audit and non-audit samples using a likelihood ratio chi-square test.

For dichotomous and continuous variables, we used the two-sample t-test to compare the audit and non-audit samples. The underlying standard errors were derived using a robust nonparametric estimation technique, based on Huber's (1967) work. Although the resulting variances are slightly larger than those calculated in the usual manner, none of the results is affected by this choice.

In most of the results presented below, we have made no adjustment for the number of comparisons being made. If we use a nominal alpha level of 10 percent, and make 30 comparisons, we would expect 3 of them to be significant by chance alone. We could correct for multiple comparisons in two ways: first, we could use Bonferroni bounds, assigning each of the comparisons an alpha level of 0.4 percent; second, we could test all of the variables together (e.g., by seemingly unrelated regression - SUR), and do a test at the 10 percent level. We have done both. With both approaches, we reach the same conclusions—the audit sample is representative of the 5,501 hospitals if one uses weights for the 16 strata used by HCFA (four census regions crossed with four bedsize groups). For simplicity of presentation, no corrections for multiple comparisons are made below.

Except for filling in the missing bedsize values, no attempt was made to replace missing data. All of the comparisons omit cases with missing values for the variable being evaluated.

Results

Table A-19 presents the mean characteristics for dichotomous and continuous variables of the audit subsample of 1,140 hospitals and the whole sample of 5,501 hospitals, without any correction for sampling. It contains results for unweighted and reweighted approaches. Table A-20 provides crosstabs for the categorical variables, for the unweighted and census region/bedsize reweighted approaches.

Audit hospitals differ significantly from the non-audit sample on all characteristics other than the Alaska/Hawaii cost of living adjustment (COLA8I), census division or region, Medicare certification, or proportion of the admissions being Medicaid patients. Audit hospitals are nearly two-thirds larger, are one seventh more expensive per case, have a lower proportion of Medicare admissions, have over twice as many interns and residents per bed, and have a higher MEDPAR case-mix value than the average hospital (Table A-19). Even adjusting for case mix, the audit hospitals are 10 percent more expensive than the average hospital. Rural and small urban area hospitals are under represented in the audit sample, as are public/government hospitals, and small hospitals (<150 beds).

This pattern remains after adjusting for urban/rural differences alone, rural/urban differences by census division, or reweighting by Medicare discharges. The imbalance is so large, that correcting for multiple comparisons will not alter the conclusions.

However, when we reweight the sample based on the 16 census region/bedsize strata used to construct the sample, we find only one difference significant at the 10 percent level—6.03 percent of the audit sample are members of the Council of Teaching Hospitals compared to 5.45 percent of all hospitals. Given the number of variables being compared, we would expect to get two or three significant comparisons at random. Using SUR on the noncategorical variables also indicates no difference for the set of variables taken as a whole.

Not only is the audit sample not significantly different from the non-audit sample, but the dif-

Table A-19.—Sample Means

Variable	Whole Sample	Audit—Reweighting Schemes				
		Unweighted	Rural	4 Census[a] 4 Bedsize	9 Census Rural[a]	Medicare Discharges
Bedsize	166.69	277.97	239.25	168.78	235.77	476.79
Hospital Cost Per Case (1981)	2,095.6	2,386.9	2,233.9	2,075.9	2,237.1	2,875.5
Medicare Discharges	1,852.4	2,819.4	2,510.9	1,891.7	2,483.3	5,074.7
Intern To Bed Ratio (1981)	0.02551	0.05817	0.04832	0.02934	0.04736	0.09576
Intern To Bed Ratio (1984)	0.02778	0.05959	0.04952	0.02917	0.04876	0.1006
Intern To Bed Ratio (1981)[b]	0.02582	0.05796	0.04812	0.02841	0.04729	0.09701
Cost Of Living Adjustment (1981)	1.0013	1.0013	1.0014	1.0015	1.0015	1.0007
Labor Market Index (1981)	0.9750	1.0053	0.9799	0.9720	0.9813	1.0611
Cases Used In Developing Case Mix	343.7	521.6	464.7	350.8	459.1	939.3
Medicare Disch. Per Bed	12.084	11.536	11.756	12.066	118.17	11.582
% Medicaid Admissions	0.1003	0.1029	0.1008	0.0986	0.1017	0.0987
% Medicaid Admissions	0.3327	0.3144	0.3223	0.3302	0.3241	0.3029
Case Mix Index (1981)	1.0019	1.0314	1.0191	1.0020	1.0191	1.0869
Case Mix Adjusted Cost Per Case	2,366.1	2,594.4	2,462.6	2,352.1	2,467.1	2,972.9
# AHA Facilities[a]	47.65	53.147	50.96	47.92	50.83	62.32
JCAH Approval[a]	0.7546	0.8132	0.7752	0.7489	0.7750	0.9595
Cancer Program Approval[a]	0.1462	0.2601	0.2235	0.1553	0.2269	0.4460
AMA Residency[a]	0.1590	0.3226	0.2679	0.1688	0.2624	0.5870
Medical School Affiliate[a]	0.1300	0.2824	0.2347	0.1400	0.2293	0.5308
Council Of Teaching Hospitals[a]	0.0545	0.1519	0.1256	0.06025	0.1231	0.2976
BC/BS Participating[a]	0.9531	0.9526	0.9521	0.9483	0.9511	0.9597
Medicare Certification[a]	0.9803	0.9839	0.9846	0.9815	0.9845	0.9885
Responded To AHA Survey[a]	0.9175	0.9767	0.9201	0.9091	0.9175	0.9652

[a]From the AHA 1981 survey.
[b]Rand version, with manual inspection of outliers.

Table A-20.—Comparison Of The Distribution Of Hospitals In The Audit Sample, Weighted And Unweighted, To The Whole Sample (In Percent)

Hospital Group	Whole Sample	Audit Sample	
		Unweighted	4 Census 4 Bedsize Weights
Urban	52.08	63.16	51.23
Rural	47.92	36.84	48.77
New England	4.47	4.30	4.30
Mid Atlantic	10.63	13.33	10.96
South Atlantic	14.02	15.00	13.67
East North Central	16.00	17.11	16.17
East South Central	8.34	8.42	8.68
West North Central	14.16	11.93	13.95
West South Central	14.12	12.89	14.09
Mountain	6.29	6.23	6.84
Pacific	11.96	10.79	11.36
Northeast	15.11	17.63	15.25
South	36.48	36.32	36.43
Midwest	30.16	29.04	30.12
West	18.25	17.02	18.20
Urban <100 Beds	12.05	7.19	9.95
100-404 Beds	30.50	28.86	30.68
405-684 Beds	7.58	19.12	8.39
685+ Beds	1.95	7.98	2.21
Rural <100 Beds	36.85	27.98	38.48
100-169 Beds	7.11	5.09	6.51
170+ Beds	3.98	3.77	3.78
Church Nonprofit	14.40	17.02	13.21
Other Nonprofit	42.72	45.53	44.10
Proprietary	11.91	10.09	11.77
Government	30.98	27.37	30.93
Non-Metropolitan	49.47	37.62	49.65
<100,000 People	1.04	0.71	0.73
100,000-250,000 People	8.31	8.58	8.53
250,000-500,000 People	8.46	9.74	8.24
500,000-1,000,000 People	7.77	10.72	8.53
1-2.5 Million People	11.85	15.82	12.11
2.5+ Million People	13.10	16.80	12.20
Month Hospital Accounting Year Ends:			
January	0.45	0	0
February	0.72	0.88	0.91
March	3.33	2.46	2.80
April	2.21	1.93	2.11
May	2.36	2.19	2.21
June	31.09	31.75	30.78
July	0.87	0.61	0.68
August	3.57	4.47	4.78
September	22.45	21.75	22.60
October	1.32	0.88	0.93
November	0.91	0.79	0.98
December	30.73	32.28	31.21

ferences are by and large quite small. The reweighted average audit hospital has two more beds than the average hospital, 1 percent lower cost per case, 2 percent more Medicare discharges, 0.17 percentage point smaller proportion of Medicaid patients, 0.25 percentage point smaller proportion of Medicare patients, and a negligibly different case mix or case-mix adjusted cost per case.

The one area with some moderate differences between the audit and non-audit samples is the teaching hospital, medical school complex of characteristics. Depending on the particular measure used, reweighted hospitals have up to 15 percent more interns and residents per bed than does the average hospital, are 6 percent more likely to have an AMA approved residency program, are 8 percent more likely to be a medical school affiliate, and 11 percent more likely to be a member of the Council on Teaching Hospitals.

Thus, if one is concerned about teaching related issues, there is an imbalance that may require special attention.

We also examined two other variables for ProPAC. The first was the mix of months for the end of the fiscal year. There was a significant difference between the audit and non-audit sample for all reweighting methods. The source of the result was largely due to the complete absence of January and dates in the audit subsample; see Table A-20. The second was to check the balance using the Medicare group number. Although the audit and non-audit are not significantly different after reweighting for the 16 census region/bedsize groups, the p value is between 0.25 and 0.10, uncorrected for multiple comparisons. The reweighted audit sample has too few urban small hospitals (<100 beds) and too many urban large hospitals (>684 beds).

These two results suggested that there might be a subtle imbalance between the two samples in the bedsize variable. A comparison of the predicted and actual probabilities of being in the audit sample indicated that the largest 10 percent of hospitals were overrepresented by about 4 percentage points, while the next ten percent was underrepresented by 3 percentage points. To test if this and other differences were systematically related to bedsize, we added a cubic spline in bedsize to the census region vs 4 bedsize group specification; the spline had knots at 150 and 300 beds. We could reject the hypothesis that there was no imbalance by bedsize at the .01 level, unadjusted for

multiple comparisons; chi-square(5) = 18.17. However, if a correction were made for the number of comparisons, this result would be marginally insignificant at the 10 percent level, using Bonferroni bounds.

Once the misfit is corrected by the cubic spline, there is no imbalance in the sample in terms of being a member of the Council of Teaching Hospitals (t= 0.80).

Discussion

The audit sample drawn by HCFA oversampled large hospitals. Although few in number, these hospitals account for a disproportionate share of all hospitalizations. By oversampling these cases, HCFA will be able to have more precision in its analysis of the bulk of the hospitals used by Medicare patients than it would have had if it had used simple proportional sampling.

Because the audit sample includes a disproportionate share of large hospitals, it also differs from the average hospital in being more expensive per case and having a more complicated case mix.

However, if we reweight the audit sample to reflect the disproportionate sampling (by four census regions interacted with four bedsize groups), then the audit sample looks fully representative of the 5,501 hospitals used to compute PPS amounts. The only significant differences were that teaching hospitals are overrepresented, and there was a minor imbalance in the mix of end dates for the accounting year. Given the large number of comparisons made here, we would expect about this number of significant findings at random. Nevertheless, there was a pattern of imbalance on AMA residency, and intern/resident to bed ratio, as well as teaching hospital status. Depending on the exact use for these data, it may be necessary to control for this pattern.

Given the small and insignificant differences between the audit and the non-audit samples, reweighted for sampling by census region and bedsize, we feel than the only remaining concern is one of precision. Is the audit sample large enough to give meaningful precision in the HCFA and ProPAC analyses?

Table A-21.—Audit Sample Standard Errors Reweighted For Census Region And Bedsize

Variable	Audit Sample Std. Error
Rural	.01621
Bedsize	4.226
Hospital Cost Per Case (1981)	27.26
Medicare Discharges	47.93
Intern To Bed Ratio (1981)	.003002
Intern To Bed Ratio (1984)	.002277
Intern To Bed Ratio (1981) (Rand Version)	.002233
Cost Of Living Adj. (1981)	.005870
Labor Market Index (1981)	.004771
Cases Used In Developing Case Mix Index	9.061
Medicare Disch. Per Bed	.1381
% Medicaid Admissions	.002568
% Medicare Admissions	.003722
Case Mix Index (1981)	.002941
Case Mix Adjusted Cost Per Case	25.79
# AHA Facilities	.6525
JCAH Approval	.01476
Cancer Program Approval	.01020
AMA Residency	.01020
Medical School Affiliate	.009172
Council Of Teaching Hospitals	.005472
BC/BS Participating	.007243
Medicare Certification	.004432
Responded To AHA Survey	.009782

Urban/Rural Versus Nine Census Divisions

In addition to assessing the overall representativeness of the audit sample given its sampling, we also examined the representativeness for each census division and rural versus urban status.

Some of the cell sizes are fairly small. As a result, the means for each of the continuous or dichotomous characteristics, and the frequencies for the discrete variable have some cells with no variation. This is particularly a problem for the audit sample for the rarer conditions, such as teaching hospital status. In such cases, the audit sample cannot be representative for certain regions.

We also found that the reweighted audit sample was significantly different from the non-audit sample in the mix of hospital type of control (profit vs. nonprofit), Medicare group, and SMSA size ($p < .01$). The mix of the four bedsize groups was not significantly different for the audit sample.

Given the size of the audit sample, and the number of rare characteristics, we feel that requiring balance for each of the 18 cells is expecting too much. Such a fine level match would require a much larger sample size.

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PAYMENT FOR CAPITAL UNDER PPS

Introduction

Medicare payment for capital-related costs has emerged as an issue of extensive health policy debate. The prospective payment system currently excludes these costs and pays hospitals for capital on a "pass-through" basis. Congress, however, established the statutory deadline of October 1, 1986, for determining a mechanism for incorporating capital payments in the prospective payment system.

A Definition of Capital

Capital represents the total economic value of an organization at any given time. It is often stated in terms of an organization's market value, and may consist of tangible and intangible assets.

Tangible assets have physical substance and may be broadly divided into: 1) current or liquid assets, and 2) fixed or long-term assets. Current assets consist of cash and other assets that can be converted into cash within one year. Fixed assets, such as plant and equipment, are of a relatively permanent nature and are intended for use in future periods.

Intangible assets are also considered long-term, but have no physical substance—for example, patents or good will. A long-term asset is systematically written-off to expense over the period of its economic usefulness through an accounting process called depreciation (for tangible assets) or amortization (for intangible assets).

Medicare's definition of capital expenditures follows generally accepted accounting principles. Payments relate to tangible fixed assets; this has not changed significantly since the program's inception. Medicare requires capitalization and write-off of a depreciable asset's cost if it has an estimated useful life of at least two years and a historical cost of at least $500. The provider may establish policy for capitalization with lower minimum criteria.

Currently, Medicare considers capital-related costs to be an allowable expense and pays hospitals on a reasonable-cost basis. According to the Medicare Provider Reimbursement Manual, capital-related costs include:

A. *Depreciation Expense*—Depreciation expense payment is based on the asset's purchase price less its salvage value.[13] In most cases, depreciation is paid on a straight-line basis wherein the asset's historical cost is recovered in equal amounts over its useful life. Medicare does not require funding of depreciation (the physical segregation of cash or securities for the replacement of assets). Therefore, hospitals may use Medicare capital payments to fund regular operations or other expenditures at their discretion, rather than setting aside payments to fund replacement of equipment or facilities.

B. *Taxes on Land and Depreciable Assets*—Generally, taxes assessed on the basis of some valuation of land or depreciable assets used for patient care are considered allowable capital costs.

C. *Leases and Rentals*—Lease and rental fees, including license and royalty fees, for the use of assets that would otherwise be depreciable if the hospital owned them, are allowable costs.

D. *Costs of Betterments and Improvements*—Allowable costs are those involving improvements that: 1) extend the estimated useful life of an asset a minimum of two years beyond its original estimated useful life, or 2) increase the productivity of an asset significantly.

E. *Costs of Minor Equipment*—Minor equipment costs that are capitalized, rather than expensed, are considered allowable by Medicare.

F. *Insurance*—Insurance expense to provide protection for the replacement of depreciable assets is an allowable cost. Also, insurance providing for indirect losses a provider

[13]The Deficit Reduction Act included a provision prohibiting facilities from "stepping up" or revaluating their assets at the time of sale or merger. Specifically, in determining allowance for depreciation, the asset value is limited to the lesser value of: 1) the allowable acquisition cost to the owner of record, or 2) the acquisition cost of the asset to the new owner.

may incur in connection with property damage or other occurrences that interrupt the normal operation of the hospital is allowable.

G. *Interest Expense*—To be considered an allowable cost by Medicare, interest expense must be incurred on funds required to satisfy a financial need of the provider in acquiring land or depreciable assets related to patient care. Interest expense incurred to borrow working capital (for operating expenses) is not allowable. Interest payments must be reduced by investment income earned by the hospital (with limited exceptions). Medicare does not reduce allowable interest expense by interest income earned on funded depreciation, restricted funds, and restricted and unrestricted donations.

H. *Return on Equity*—For proprietary providers, Medicare pays hospitals for a reasonable return on equity capital invested and used in providing patient care. The allowable return is calculated as the average investment of the owners during the reporting period. Currently, the rate of return paid is "equal to the average of the rates of interest, for each of the months any part of which is included in the reporting period, on obligations issued for purchase by the Federal Hospital Insurance Trust Fund" (Pub. L. 98-21).

I. *Capital Cost of Related Organizations*—The capital costs of an organization (furnishing services, facilities, and supplies) that is related to a provider as a result of common ownership or control are considered allowable costs.

Current Regulation of Capital Payments

Efforts to plan and regulate capital expenditures have been introduced in the past. The National Health Planning and Resources Development Act of 1974 mandated that all states eventually enact certificate-of-need (CON) review legislation requiring health facilities to receive prior approval for construction and other capital projects in order to be licensed.

Currently, there is no *direct* link between the CON review program and Medicare reimbursement for capital-related costs. Medicare payment for provider capital expenditures, however, may be indirectly affected by CON review. For example, an intermediary may disapprove a capital expenditure on the basis that it is "unreasonable" if the CON application had been disapproved by the planning agency and the intermediary was aware of the disapproval.

Federal efforts to regulate Medicare capital expenditures were introduced in Section 1122 of the Social Security Act (1972 amendments). This section outlined an agreement that may be established between the Secretary and any state wherein a designated planning agency of the state would: 1) make recommendations regarding capital expenditures proposed by or on the behalf of any health care facility in the state, and 2) establish procedures for any person wishing to appeal a recommendation by the designated agency. The Secretary is authorized to withhold Medicare payment for certain capital costs related to provider projects disapproved by the designated state planning agency.

Section 1122 authorizes disallowance of Medicare payment for capital-related costs only when a facility's application is disapproved. If no action is taken (including situations in which an 1122 review program has not been established in the state), Medicare payment for capital-related costs must be granted (assuming they are within the limits of allowable costs).

As more states established CON programs (as mandated by the 1974 health planning legislation), they discontinued the 1122 review, largely due to inconsistency of requirements between the programs. As discussed later in this section, if legislation is not enacted to incorporate capital in the prospective payment system by October 1, 1986, the Section 1122 review program will become mandatory.

In developing the prospective payment system, Congress recognized that additional study was required to include capital payments in the new system. For this reason, it specifically excluded capital-related costs from PPS and, until October

1986, continued payment for these costs on a reasonable-cost basis. To facilitate future inclusion of capital costs in PPS, Congress added a provision stating "the Secretary of Health and Human Services shall study, develop, and report to the Congress within 18 months after the date of the enactment of this Act on the method and proposals for legislation by which capital-related cost, such as return on net equity, associated with inpatient services can be included within the prospective payment amounts computed under section 1886(d) of the Social Security Act" (Pub. L. 98-21).

In addition, Congress stipulated that if no legislation is passed by October 1, 1986 for the inclusion of capital costs into PPS, the Medicare program will not pay for these costs unless the state has a Section 1122 capital approval agreement and the state has recommended approval of the expenditure. Therefore, Section 1122 review, currently a voluntary program, would become mandatory in order for hospitals to receive Medicare payment for capital-related costs.

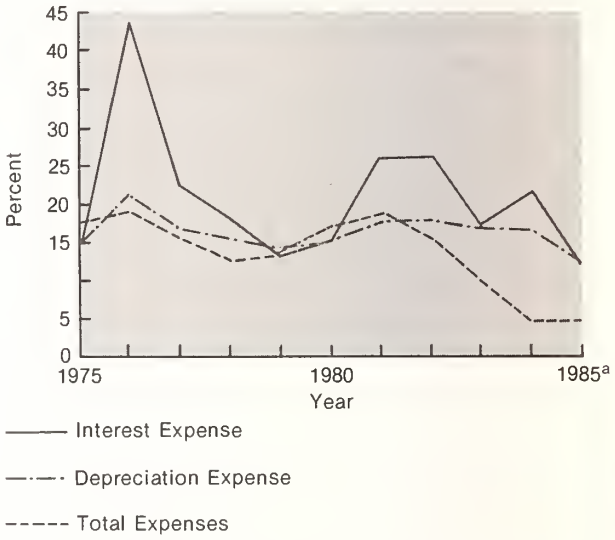
Furthermore, the legislation included a provision warning that "it is the intent of Congress that, in considering the implementation of a system for including capital-related costs under a prospectively determined payment rate for inpatient hospital services, costs related to capital projects for which expenditures are obligated on or after the effective date of the implementation of such a system, may or may not be distinguished differently from costs of projects for which expenditures are obligated before such date" (Pub. L. 98-21). This provision has provoked some controversy, but, together with the accompanying bill report language, it is generally interpreted to mean that capital expenditures obligated after the date of the legislation may be treated differently under PPS than expenditures obligated before that date.

Capital Expenditures

Recent Level and Trends for Capital Spending

According to American Hospital Association (AHA) Panel Survey data for the period 1975-1985, the annual percentage increase for capital was greater than that for total costs for all years except 1980. This has resulted in significant increases in capital/total cost ratios for this period. (Refer to Figures A-1 and A-2 and Table A-22.)

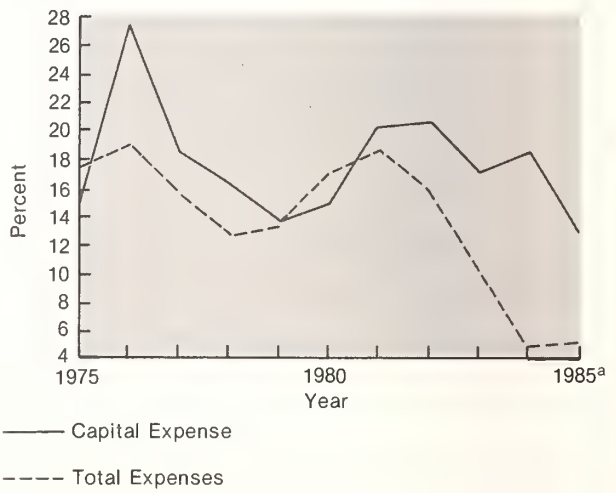
Figure A-1.—Percentage Increase In Depreciation, Interest, And Total Expenses From Prior Year



[a]Based on estimate derived through comparison of January-October of 1985 with January-October of 1984.

SOURCE: AHA Panel Survey Data.

Figure A-2.—Percentage Increase In Hospital Capital And Total Costs From Prior Year



[a]Based on estimate derived through comparison of January-October of 1985 with January-October of 1984.

SOURCE: AHA Panel Survey Data.

Table A-22.—The Relationship Between Capital, Operating And Total Costs For The Period 1980 To 1985 And Percent Increase From Prior Year (Dollars In Billions)

	1980	1981	1982	1983	1984	1985[a]
Capital Costs	$4.9	$5.9	$7.1	$8.4	$9.9	$11.1
	(15%)	(20%)	(20%)	(18%)	(18%)	(12%)
Operating Costs	$74.4	$88.3	$102.0	$111.8	$116.1	$122.2
	(17%)	(19%)	(16%)	(10%)	(4%)	(6%)
Total Costs	$79.3	$94.2	$109.1	$120.2	$126.O	$133.3
	(17%)	(19%)	(16%)	(10%)	(5%)	(6%)
Capital/Operating Cost Ratio	6.6	6.7	7.0	7.5	8.5	9.1
	(−2%)	(2%)	(5%)	(7%)	(13%)	(7%)
Capital/Total Cost Ratio	6.2	6.3	6.5	7.0	7.9	8.3
	(−2%)	(2%)	(3%)	(8%)	(13%)	(5%)

[a]Estimates based on expenditures year-to-date (YTD) through October 1985; percentage increases based on amounts YTD through October 1984 versus YTD through October 1985.

SOURCE: AHA Panel Survey Data.

Large fluctuations in interest rates, observed in Figure A-1, contributed to significant percentage increases in total capital costs observed in Figure A-2 for the years 1976, 1981-1982, and 1984. Although capital costs continue to grow, the annual percentage change showed signs of decreasing in 1985. In fact, depreciation expense remained stable for the period 1982 to 1984 and decreased in 1985.

The incentives of PPS for capital/labor substitution may have some effect on the level of capital spending. Figure A-1 illustrates a significant decline in annual percentage increase in total costs occurring since 1981, while annual percentage changes in depreciation expense have remained stable for this period.

Stable depreciation levels do not only indicate that hospitals are inefficiently substituting capital for operating costs in response to distorted PPS incentives. Several other factors, such as replacement of existing facilities, may contribute to sustained percentage increases in depreciation while total costs are dramatically declining. Replacement will contribute to increases in depreciation amounts because older plant is expressed in terms of historical dollars, whereas new plant is represented in more current, higher dollars. When assets are replaced, their historical value is substituted with current costs.

Some individuals point out that hospitals cannot reduce their capital costs as quickly as their operating or total costs because capital costs are more long-term and fixed in nature. For example, a hospital must continue to pay the capital costs of fixed plant, regardless of declines in utilization. Some operating costs, however, vary with changes in utilization and can be reduced in the short term when the volume of services declines. Therefore, while there may be sharp declines in the annual percentage increases in total costs, capital costs remain stable even though utilization has dropped substantially.

Based on AHA Annual Survey data for 1983 and 1984 building and fixed equipment accounted for approximately 60 percent and moveable equipment accounted for approximately 40 percent of total capital expenditures (not including land and construction-in-progress).

The Office of the Assistant Secretary for Planning and Evaluation (ASPE) estimates that Medicare expenditures for capital-related costs for fiscal year 1984 were 7.4 percent of total Medicare inpatient expenditures. This amount, approximately $2.9 billion, is comprised of 69 percent depreciation expense (55 percent depreciation for fixed assets; 14 percent for movable assets), 24 percent interest costs, and 7 percent return on equity.

Variations in Capital Expenditures Among Hospitals

ASPE identified considerable variation in the ratio of capital to operating costs among hospi-

tals for 1981. Listed below is the distribution of hospitals:

Ratio of Capital to Operating Costs	Percentage of Hospitals
Less than 2%	7.0%
2%-4%	17.7%
4%-6%	26.8%
6%-8%	18.5%
8%-10%	12.0%
10%-15%	13.2%
15%-20%	3.4%
Greater than 20%	1.4%

It is difficult to identify the factors contributing to the uneven distribution of capital-related costs among hospitals participating in the Medicare program. Overall, however, the age of the hospital's assets has the greatest impact on capital-related expenditures—the newer the assets, the higher the costs. Several analyses have been undertaken to determine other hospital characteristics that influence the level of capital expenditures, but none has been shown to explain a high degree of variation in capital expenditures among hospitals.

An analysis performed by ASPE and presented in its background paper entitled "Capital in the Hospital Industry," determined that "hospital characteristics associated with higher capital expenditures include for-profit ownership; bed changes of more than 10 percent in the last 5 years; and the presence of a management contract . . . Hospital characteristics associated with lower ratios of capital costs to operating costs include a proportion of Medicaid patients greater than 15 percent; government ownership; membership in the Council of Teaching Hospitals; and a New England location."

The AHA, in its study entitled "Capital-Related Cost Variation Across Hospitals," determined that characteristics commonly used to describe hospitals fail to account for a large portion of the variation in capital-related costs. In an analysis using 1982 AHA annual survey data, the combined characteristics of age, region, bed size, and urban/rural status accounted for only 20 percent of the hospital capital cost variation. An intermediate set of variables (e.g., ownership, Medicare/Medicaid involvement, percentage of uncompensated care, multihospital system involvement, Medicare case-mix index, and interns and residents) accounted for an additional 24 percent of the variation.

Information presented in the AHA study noted above indicates that, in addition to having lower operating costs, rural hospitals have lower capital costs than urban hospitals. Capital and operating costs tend to move in the same direction as demonstrated by the small variation in capital/operating cost ratios between urban and rural hospital groups. Specifically, the urban capital/operating cost ratio has a mean value of 7.3 percent and a median value of 6.4 percent. The rural capital/operating cost ratio has a mean value of 6.7 percent and a median value of 5.6 percent. National capital/operating cost ratios are 7.0 percent (mean) and 6.0 percent (median).

Finally, in an analysis performed for ProPAC by the Johns Hopkins University Center for Hospital Finance and Management, the findings indicated that there was very little relationship between occupancy rate and (a) capital cost per case, or (b) ratio of capital to total cost. Hospitals with low occupancy rates did not systematically have high capital costs per case. In fact, the relationship that did exist was positive, indicating that hospitals with high occupancy rates had correspondingly high capital costs per case and those with low occupancy rates had lower costs per case. When the influence of bedsize and location is removed by computing a ratio of capital to total costs, then the association with occupancy falls to zero.

Table A-23 demonstrates that it is most common for hospitals' capital costs per case to range from $100 to $200 and least common for capital costs per case to range from $75 to $100. Of the hospitals reporting capital costs of less than $75 per case, 33 percent have occupancy rates of less than 50 percent; these hospitals represent more than 10 percent of the sample.

Therefore, many hospitals with low occupancy levels have correspondingly low capital costs per case. In fact, even though Medicare may be paying for excess capacity in these institutions (as discussed in a subsequent section), these costs are substantially less than those of many high occupancy hospitals. Furthermore, Table A-24 dem-

Table A-23.—The Relationship Between Occupancy Rate And Capital Cost Per Case

Frequency Percent Of Total Hospitals Row Percent Column Percent	Capital Cost Per Case				
	<$75	$75-$100	$100-$200	>$200	Total
# Of Hosp. With <50% Occupancy	560	200	356	221	1,337
Percent Of Total Hospitals	10.35	3.69	6.58	4.08	24.7
Row Percent	41.88	14.96	26.63	16.53	
Column Percent	33.27	25.54	18.73	21.13	
# Of Hosp. With 50-65% Occupancy	492	228	486	251	1,457
Percent Of Total Hospitals	9.09	4.21	8.98	4.64	26.92
Row Percent	33.77	15.65	33.36	17.23	
Column Percent	29.23	29.12	25.57	24.00	
# Of Hosp. With 65-75% Occupancy	363	173	518	258	1,312
Percent Of Total Hospitals	6.71	3.20	9.57	4.77	24.24
Row Percent	27.67	13.19	39.48	19.66	
Column Percent	21.57	22.09	27.25	24.67	
# Of Hosp. With >75% Occupancy	268	182	541	316	1,307
Percent Of Total Hospitals	4.95	3.36	9.99	5.84	24.15
Row Percent	20.50	13.93	41.39	24.18	
Column Percent	15.92	23.24	28.46	30.21	
Total Hospitals	1,683	783	1,901	1,046	5,413
Percent Of Hospitals	31.09	14.47	35.12	19.32	100.00

SOURCE: 1981 Medicare Cost Report data, as presented in a project entitled "Study of the Relationship Between Capital and Operating Costs in Hospitals;" conducted for ProPAC by the Center for Hospital Finance and Management, Johns Hopkins Medical Institutions, January 1986 (ProPAC Contract Number T-33727596).

Table A-24.—The Relationship Between Occupancy Rate And Capital/Total Cost Ratios

Frequency Percent Of Total Hospitals Row Percent Column Percent	Capital/Total Cost Ratio				
	<4%	4%-7%	7%-10%	>10%	Total
# Of Hosp. With <50% Occupancy	287	568	253	229	1,337
Percent Of Total Hospitals	5.30	10.49	4.67	4.23	24.70
Row Percent	21.47	42.48	18.92	17.13	
Column Percent	26.50	26.35	21.14	23.44	
# Of Hosp. With 50-65% Occupancy	288	559	310	300	1,457
Percent Of Total Hospitals	5.32	10.33	5.73	5.54	26.92
Row Percent	19.77	38.37	21.28	20.59	
Column Percent	26.59	25.93	25.90	30.71	
# Of Hosp. With 65-75% Occupancy	264	513	306	229	1,312
Percent Of Total Hospitals	4.88	9.48	5.65	4.23	24.24
Row Percent	20.12	39.10	23.32	17.45	
Column Percent	24.38	23.79	25.56	23.44	
# Of Hosp. With >75% Occupancy	244	516	328	219	1,307
Percent Of Total Hospitals	4.51	9.53	6.06	4.05	24.15
Row Percent	18.67	39.48	25.10	16.76	
Column Percent	22.53	23.93	27.40	22.42	
Total Hospitals	1,083	2,156	1,197	977	5,413
Percent Of Hospitals	20.01	39.83	22.11	18.05	100.00

SOURCE: 1981 Medicare Cost Report data, as presented in a project entitled "Study of the Relationship Between Capital and Operating Costs In Hospitals;" conducted for ProPAC by the Center for Hospital Finance and Management, Johns Hopkins Medical Institutions, January 1986 (ProPAC Contract Number T-33727596).

onstrates that it was most common for hospitals' capital costs to represent 4 to 7 percent of their total cost, regardless of occupancy rate.

Future Capital Requirements and Assumptions

There is a wide range of estimates for hospital capital requirements in the 1980s. Some believe that current levels of capital investment are inadequate. They argue, first, that Medicare capital payment based on historical cost depreciation is substantially less than replacement costs, resulting in payments to hospitals below the cost of capital. Replacement cost depreciation would adjust for price level changes and permit hospitals to replace existing items of equipment at current prices at the end of their useful lives. Secondly, they point out that philanthropy, as a source of financing, is declining and hospitals will require additional funds to replace this capital source. Third, they cite the need to replace or modernize facilities built in the 1950s under the Hill-Burton program. Fourth, they point out that hospitals need to upgrade technology to meet heightened expectations for availability of the latest facilities and equipment generated by a growing supply of new physicians and the public attitude toward technological advancement. Finally, they argue that the demand for health facilities will increase over the decade due to the aging population; therefore, hospital capital expenditure levels must increase in order to maintain capacity.

Others state, however, that present capital spending levels are adequate or excessive. They argue that the hospital industry currently faces excess capacity and that increased aggregate capital expenditures would exceed demand. Also, they argue that projected declines in hospital use would reduce the need for new construction and renovation, thus reducing capital expenditures significantly. Finally, they point out that increased levels will be expensive since capital expenditures generally result in increased operating costs.

In most industries, capital expenditures reduce labor and other operating costs. In the hospital industry, however, rapidly changing technology is reflected in capital acquisition and the product is not held constant. Therefore, direct substitution of capital for operating costs is seldom observed. While substitution may exist to some extent (e.g., replacement of manual labor with automated equipment in the laboratory), it is more often associated with a change in the hospital product.

A study conducted by Arthur D. Little, Inc. for the Office of the Assistant Secretary for Health, DHHS (April 1982) concluded that, on average, every dollar invested in capital projects resulted in an additional 22 to 30 cents in operating expense in the following year. This study was conducted using selected tracer technologies and provides a general, although not exact, impression of the relationship between operating and capital costs. The operating cost consequences of capital expenditures vary based on the type of hospital; recognition of efficiencies in equipment staffing and use; the nature of the expenditure and the age of the capital asset.

In a study of hospital capital requirements conducted by ASPE, estimates for the 1980s ranged from $49 billion to $231 billion. Estimates were derived based on differing sets of assumptions regarding demand for hospital services, changes in population and HMO enrollment, renovation standards, construction costs, occupancy rates, inflation rates, and new technology. The wide variation in capital expenditure estimates reflects the problems and imprecision in predicting demand and in estimating an absolute level of payment required to support a given level of capital expenditures.

Toward a New Capital Policy Under PPS: Criteria, Issues, and Options

Under the existing cost-based system for capital payments, hospitals are not awarded for cost-effective investment decision making. Instead, the system promotes insensitivity to interest rates and alternative financing methods. Individual hospitals are currently reimbursed for capital expansion projects that may exceed the needs of the Medicare population served. In some instances, this has resulted in excess capacity.

In addition, since Medicare reimburses hospitals on the basis of Medicare utilization as a portion of total hospital utilization, the program may

be paying for costs related to unoccupied beds. This cost, however, varies significantly, as demonstrated in Table A-23.

Finally, the current capital payment method provides incentives for hospitals to substitute capital for labor or other operating costs by providing the DRG operating payment *plus* the capital cost pass-through. As a result, the hospital that can find ways to decrease operating costs by substituting capital may increase its total Medicare payments.

Capital Payment Evaluation Criteria

In order to systematically evaluate capital payment options, the Commission adopted the criteria listed below. The capital payment evaluation criteria that were regarded as most important include:

1. Provide Neutrality Regarding Capital/Operating Cost Trade-offs—The system adopted should not favor either capital or operating costs. Instead, it should encourage hospitals to choose the optimal combinations of these components in order to achieve long-term cost effectiveness of care. Provided with incentives consistent with PPS, individual providers are in the best position to determine the most efficient capital/operating cost mix based on the unique characteristics of their institutions.

2. Reflect Capital Intensity Variations Across DRGs—Capital payments should vary by DRG based on the relative capital intensity of the DRGs. While aggregate capital payments will remain the same, the distribution of payments should be determined, in part, by the hospital's case mix. This will ensure that hospitals are not given the incentive to shift services to less capital-intensive DRGs which might reduce access to certain services for Medicare beneficiaries.

3. Control Aggregate Expenditures and the Level of Capital Growth—The system should enable Medicare to predict and control aggregate payments per case in the future. The payment mechanism should discourage spending that leads to excess capacity or that subsidizes more than Medicare's share. Instead, it should provide funding of capital/operating cost levels that are consistent with long-term cost-effectiveness. In the absence of overwhelming evidence to the contrary, long-term cost-effectiveness will be interpreted as the payment amount which is no greater than that which would have been spent had capital not been incorporated into the Medicare prospective payment system.

Other criteria discussed and adopted by the Commission include:

4. Recognize Capital Cost Variations that are Beyond the Hospital's Control—The system should not unduly penalize hospitals for factors having an adverse impact on payments that are beyond their control. These factors include "nondiscretionary" capital expenditures such as those necessary to meet state and federal regulatory requirements.

5. Promote Administrative Simplicity and Predictability—The capital payment mechanism should be easy to understand and should reduce the administrative burden and associated cost of reporting and maintaining records. Furthermore, the method adopted should provide predictability of capital payments both for hospitals and for the Medicare program.

6. Implement as Quickly as Possible—The capital payment mechanism should be implemented as soon as possible. The prospective payment system's distorted incentives, due to the continued capital pass-through, need to be resolved quickly. Expeditious implementation, however, should not prevent the adoption of the most effective capital payment proposal. Therefore, an interim approach to capital payments may be required.

7. Support the Development and Diffusion of New, Cost-Effective, Capital-Intensive Technologies—The payment mechanism should enable manufacturers and hospital managers to make appropriate decisions regarding the development and adoption of cost-effective, capital-intensive technologies.

Commission's Analysis of Hospital Capital Issues

Determining capital payment policy under the Medicare program requires analysis of several issues including:

- the aggregate amount or level of capital expenditures to be financed by Medicare,

- the method for achieving recognition of hospital variations in capital payments, and
- the duration and method of transition from the present cost-based system to the new capital payment system.

The wide range of estimates for capital expenditures in the 1980s highlights the difficulty in determining the absolute level that the Medicare program should attempt to finance. Capital payment amounts could be determined on the basis of past or current reimbursement levels, or varying estimates for future requirements. Focusing on future capital requirements, however, may not be effective in establishing payment levels since the estimates are subject to a wide range of error, depending on the assumptions used.

Related to the aggregate amount of capital financed is the method for distributing capital payments to hospitals. The extent to which payment amounts reflect differences in capital requirements among hospitals will affect the distributional consequences of the approach.

The transition to a new capital payment system will have significant effect on many hospitals. The transition should enable hospitals to absorb the financial impact of moving to new capital payment policy. In addition, however, the transition should reflect PPS objectives by establishing uniform capital payments for hospitals. Therefore, maintaining a balance between providing equitable capital payments and promoting PPS incentives is essential in determining the method of transition.

Level of Payment.—Determining the level of payment involves selecting the amount (the federal portion) that Medicare will pay in the aggregate for capital-related costs under a new payment mechanism. While future policy decisions may also affect this amount, the level sets the initial baseline for payments. The fundamental debate over the level of payment focuses on whether future payments should be more, less, or the same amount as current hospital capital expenditures.

There are several options for setting the level of capital payments for hospitals that focus on:

- the base year used to set payments, and
- the method used to trend base year amounts to fiscal year 1987.

In addition, separate baselines and trend methods could be implemented for fixed and moveable equipment. While this is not presented as a specific option below, these capital cost components could be separated under any of these approaches.

Base Year Alternative One: Set Payments at a Pre-PPS Level—Capital payments could be set at a level corresponding to costs existing prior to the introduction of PPS. Some individuals believe that this approach is preferable since hospitals faced neutrality in capital/operating cost trade-offs under cost-based reimbursement. In addition, the hospital industry currently faces excess capacity due to declines in inpatient utilization.

Setting payments at a pre-PPS level would be easy to administer, would provide predictability of payments, and could be implemented quickly. This is because the data required to set payments is readily available from audited Medicare Cost Reports. Both hospitals and health policy-makers would have actual capital costs on which to base capital payments for fiscal year 1987 and beyond.

Base Year Alternative Two: Set Payments at a More Current Level—Capital payments could be based on more recent estimates of capital expenditure levels or on estimated average capital costs for a recent period of time (two to three years). These current levels may reflect more accurately the true capital requirements of the hospital industry. As indicated previously, estimates show that capital/operating cost ratios have increased since the introduction of PPS. Some believe that the industry is at a point of expansion in its capital cycle and that many obligations made in the early 1980s were just recently reflected in expenditure data. Furthermore, recent increases in total capital spending may reflect outpatient-related capital expansion.

The approach of setting payments at more current levels could be easy to administer, be implemented quickly, and provides predictability of payments. Although data are not available for the actual current capital cost levels, the necessary amounts could be estimated.

Base Year Alternative Three: Set Payments at a "Capital Requirements" Level—Rather than base the capital level on actual past or present values, it is possible to base payments on estimates of capital requirements. There is little agreement, however, on how such estimates should be arrived at.

Attempting to set capital payments based on estimated requirements may introduce administrative complexity. Depending upon the assumptions used, the method of estimating the appropriate capital requirements level may be resource-intensive to maintain and expensive to administer. Also, it would be difficult to implement this approach quickly since the method(s) used to derive capital requirements estimates may be subject to extensive debate and disagreement.

Trend Alternative One: Apply the Base Year Average Capital/Operating Cost Ratio to Estimated Inpatient Operating Costs for Fiscal Year 1987—The capital/operating cost ratio existing in the base year could be applied to estimated Medicare inpatient operating expenditures for fiscal year 1987 to determine aggregate capital payments. This trend method perpetuates the relationship between capital and operating costs that existed during the base year. It also provides for increased capital payments beyond general inflationary trends, thus reflecting the industry's capital needs more accurately than alternative methods.

Trend Alternative Two: Trend Forward the Base-Year Aggregate Medicare Inpatient Capital Expenditures to the Present Using a Capital Market Basket Index—Aggregate Medicare inpatient capital expenditures in the base year could be trended forward to fiscal year 1987 using a capital market basket index to determine aggregate capital payments. This approach pays only for capital expenditure increases equal to the estimated rate of growth in the input costs of capital faced by hospitals. Finally, this approach does not penalize hospitals for declining inpatient volume.

Trend Alternative Three: Trend Forward the Base Year Capital Cost Per Case Using a Capital Market Basket Index—The base year capital cost per case could be trended forward using a capital market basket index and multiplied by estimated inpatient volume for fiscal year 1987. This amount could then be used as the basis for determining aggregate payment amounts for capital. Under this approach capital payments are reduced to reflect declining inpatient volume and payment per case is consistent.

Table A-25 provides information regarding the magnitude of difference in Medicare inpatient capital payments for the level and trend options presented above. Cumulative capital payments, savings and percent reduction from current law estimates for the period 1987-91 are presented.

Table amounts were derived using HCFA actuaries' estimates for Medicare inpatient operating and capital payments and case volume for the period 1983-91. The actuaries' estimates may overstate Medicare capital payments under all scenarios, however, since they do not attribute a portion of increased capital spending to expansion of outpatient services. The table shows significant differences in capital payments, and savings from current law projections, depending on the base year and trend option selected. (Refer to Table A-25 for limitations of estimates.)

Table A-25.—Cumulative Capital Payments And Reductions From Current Law, Under Various Capital Level Options—FY87 Through FY91[a]

Base Year	Trend 1	Trend 2	Trend 3
Cumulative Payments[a] (In Billions):			
1987	29.3	29.3	29.3
1985	25.6	22.2	23.8
1983-85	23.6	20.6	19.8
1983	22.0	18.6	16.9
Cumulative Savings[a] (In Billions):			
1987	−7.1	−7.1	−7.1
1985	−10.8	−14.2	−12.6
1983-85	−12.8	−15.8	−16.3
1983	−14.4	−17.8	−19.5
Cumulative Reduction[a]:			
1987	−19.6%	−19.6%	−19.6%
1985	−29.6	−39.1	−34.7
1983-85	−35.1	−43.4	−45.5
1983	−39.5	−48.8	−53.6

[a]Estimates are for comparison purposes only—savings are estimated as if capital were paid entirely as an add-on to the federal portion of the payments for each of the five years, i.e., there is no transition. The estimates assume that PPS capital payments are trended forward by the capital market basket, which the HCFA actuaries currently assume will not change from 1987 to 1991. If any increase in PPS capital payments were assumed, savings would be smaller.

In addition to the level at which capital is added to the standardized amounts, payments and savings from a capital add-on would depend on a number of factors including: 1) the manner in which capital would be paid for on a hospital-specific basis, 2) the blend of hospital-specific and federal capital payments, 3) the manner in which the shift to prospective payment for capital was phased-in during the federal fiscal year, 4) the method of updating the capital portion of PPS payments, and 5) treatment of return on equity and interest offsets.

SOURCE: ProPAC estimates based on data from HCFA, Office of the Actuary.

- *Trend 1* was calculated by applying capital/operating cost ratio estimates for the base year (e.g., 1983, 1983-85, 1985, or 1987) to the actuaries' estimates for Medicare inpatient operating costs in 1987 and then trending this amount forward during the period 1987-91. For example, by selecting: a) 1985 as the base year and b) trend option 1, aggregate Medicare inpatient capital payments for the period 1987-91 would be $25.6 billion. Estimated savings from current law capital projections for this period would be $10.8 billion, or 29.6 percent.
- *Trend 2* was calculated by taking the actuaries' estimate of aggregate Medicare inpatient capital expenditures in the base year and trending this amount forward to 1987 using the capital component of the HCFA market basket index. This aggregate amount was then trended forward for the period 1987-1991. For example, by selecting: a) 1983-85 as the base year, and b) trend option 2, aggregate Medicare inpatient capital payments for the period 1987-91 would be $20.6 billion. Estimated savings from 1987 current law projections for this period would be $15.8 billion or 43.4 percent.
- *Trend 3* was calculated by determining the actuaries' Medicare capital payment *per case* in the base year and trending this amount forward to 1987 using the capital component of the HCFA market basket index. This trended per case capital payment amount was then multiplied by projected case volume for 1987 in order to determine aggregate Medicare capital payments. Per case amounts were then trended forward for the period 1987-91. For example, by selecting: a) 1983-1985 as the base year, and b) trend option 3, aggregate Medicare inpatient capital payments for the period 1987-91 would be $19.8 billion. Estimated savings from 1987 current law projections for this period would be $ 16.3 billion or 45.5 percent.

Hospital aggregate and per case capital payments differ between trend option 2 and 3. This is because trend option 2 increases Medicare capital payments in the base year by the market basket index and by dividing the aggregate amount by projected cases in fiscal year 1987 and beyond. Trend option 3 increases the capital payment per case existing in the base year by the capital market basket index only. Under trend option 2, hospitals are not penalized due to declines in case volume occurring since the base year. Furthermore, trend option 2 assumes that hospital capital costs are more fixed than operating costs and, therefore, do not decrease or increase as volume fluctuates in the short term.

Commission's Recommendation for the Level of Capital Payments (Recommendation 7)—Capital payments should be set at the following levels:

- For building and fixed equipment, projected average Medicare actual capital costs per discharge for fiscal year 1985, trended forward.
- For moveable equipment, average actual Medicare capital costs per discharge in 1983, trended forward.

Method of Payment.—In addition to determining the base level of payment for capital, a decision must be made regarding how to distribute capital payments to hospitals. There is a wide range of capital payment methods that focus on a financial or regulatory approach, or a combination of the two. Generally, the methods can be viewed as: a) not distinguishing between capital and operating costs (an all-inclusive rate), or b) providing special treatment of capital, or various capital components. In determining a capital payment method, the goal should be to apply payments in a manner that reflects genuine capital cost variations.

Within the all-inclusive rate method, there are several options including a fixed percentage or flat dollar amount add-on, a DRG-specific add-on, or a "total revenue" approach. In providing special treatment of capital components, the payment mechanism could distinguish between fixed and moveable equipment. All of these approaches are discussed below.

Alternative One: All-Inclusive Rate/Fixed Percentage or Flat Dollar Amount Add-on—Under this option, hospitals would receive a single payment for the operating and capital-related costs of treating a Medicare patient. A uniform percentage or dollar amount could be added to the total standardized amounts, or some component of the

standardized amount. The all-inclusive standardized amount would then be multiplied by the DRG weight to arrive at a single payment per DRG that reflects both the operating and capital cost components.

This approach provides neutrality in capital/operating cost trade-offs. The total Medicare payment for a given DRG will remain the same regardless of the hospital's capital/operating cost mix for that DRG. The fixed percentage add-on promotes reduction of total DRG costs while providing hospital management flexibility to maximize efficiency gains. Also, it encourages extended use of physical assets and prudent purchasing behavior. It reflects DRG capital intensity, to the extent that the DRG weights correspond to their capital intensity. (Some believe that existing charge weights reflect accurately the relative capital intensity variations across DRGs. They cite that hospitals' billed charges include operating as well as capital expenses.)

This method would be easy to understand and administer and would provide predictability of payments. Aggregate capital payments would be subject only to fluctuations in volume and mix of patients. Since it is administratively simple and does not require significant data development, this approach could be implemented quickly.

The percentage add-on could be determined in the following ways:

1. By computing the capital percentage add-on based on the nonlabor portion of the standardized amount—the capital payment portion would not be affected by differences in area wages and teaching status. Total payments (including operating and capital cost components) would be greater for hospitals with higher case-mix indexes.
2. By computing the capital percentage add-on based on the adjusted labor portion of the standardized base—the area wage adjustment may serve as a proxy for different geographical variations in capital costs (such as construction costs). Capital payment amounts would not be affected by teaching status, but would be greater for hospitals with higher case-mix indexes.
3. By computing the capital percentage on the entire adjusted standardized amount (including teaching adjustments)—greater capital payment amounts will go to hospitals with higher area wages and teaching status. Payments would also be greater for hospitals with higher case-mix indexes.

Table A-26 shows examples of payments to two hospitals, one a teaching hospital in San Francisco, CA and the second a non-teaching community hospital in Terre Haute, IN. The example assumes a capital add-on of *7.0 percent* of total operating costs. For each hospital, the capital component and the total all-inclusive payment are calculated for DRG 397, Coagulation Disorders, based on the ways described above. The example assumes 100 percent national urban rates.

The differences in how the total payment "pie" is divided between the two hospitals over the three methods are substantial. In the example for DRG 397, the first payment method would pay each hospital its adjusted standardized amount, plus a capital portion which is uniform among hospitals. The second payment method would *increase* Hospital A's capital portion by 31.6 percent and its total payment by 1.5 percent, while *reducing* Hospital B's capital portion and total payment by 31.6 percent and 3.2 percent, respectively. The third payment method further increases Hospital A's capital portion, by 37.1 percent over the first method, and increases the total payment by 1.8 percent. Hospital B's capital payment is reduced 37.1 percent and the total payment is reduced 3.7 percent.

Alternative Two: All-Inclusive Rate/DRG-Specific Add-on—Under this approach, an estimate of the capital cost component would be calculated for each DRG, based on its capital intensity. This estimate would then be added to the DRG operating payment in the form of a varying flat dollar or percentage add-on.

The DRG-specific add-on is similar to the fixed percentage add-on approach in that it provides neutrality in capital/operating cost trade-offs, provides incentives consistent with PPS, and controls Medicare capital growth. The DRG-specific add-on approach also recognizes variations in

Table A-26.—Alternatives For Calculating The Percentage Add-On To The Standardized Amounts—An Illustration[a]

Hospital A
Location: San Francisco, CA
Wage Area Index: 1.6376
Teaching: 0.25 interns and residents/bed

Hospital B
Location: Terre Haute, IN
Wage Area Index: 0.8506
Non-Teaching

Hospital Payments For DRG 397: Coagulation Disorders (1986 Weight: 0.9956)[b]

	Payment 1[c]		Payment 2[d]		Payment 3[e]	
	Capital Portion	Total Payment	Capital Portion	Total Payment	Capital Portion	Total Payment
Hospital A	292.83	6,029.95	385.45	6,122.57	401.60	6,138.72
Hospital B	292.83	2,922.20	200.21	2,829.58	184.06	2,813.43
Totals	585.66	8,952.15	585.66	8,952.15	585.66	8,952.15

[a]Explicitly for purposes of illustration, a universe of two hospitals has been created, with operating costs totalling $8,366.49. The capital add-on is 7% of total operating costs, or $585.66. Therefore, the fixed total amount of payments is $8,952.15. This table shows three methods of distribution of those dollars, depending on how the add-on method is computed. *In all cases, more capital dollars will go to the hospitals with the higher case-mix indexes.*
[b]Estimated payments under 100% national urban rates.
[c]Capital portion is a fixed percentage applied to the non-labor portion of the standardized amount. The amount is not affected by wage or teaching adjustments.
[d]Capital portion is a fixed percentage applied to the labor portion of the standardized amount. The area wage adjustment affects the amount, teaching status does not.
[e]Capital portion is a fixed percentage applied to the total adjusted standardized amount. The amount is affected by both area wage index and teaching status.

capital intensity among DRGs. By doing so, this approach may provide incentives for the development and adoption of new technologies to the extent that aggregate capital dollars may be shifted in accordance with the increase in DRG capital intensity.

This approach would be administratively complex to implement, however. Specifically, the data used to create PPS rates do not identify capital costs by individual case or DRG. Therefore, determining capital intensity by DRG would require significant data collection efforts, thereby reducing the feasibility of fast implementation. Furthermore, capital intensity for individual DRGs may vary significantly by hospital, depending on the specific technologies adopted to treat patients.

Alternative Three: All-Inclusive Rate/Recalculate PPS Rates to Include Capital—Under this approach, the components of PPS payments would be recomputed to reflect the addition of capital into PPS. The addition of capital to PPS payments will result in new standardized amounts, and new proportions for labor and nonlabor components. Likewise, it may also require changes in the indirect teaching adjustment or other adjustments in effect (such as the disproportionate share adjustment).

By unifying the PPS rate structure, this approach provides neutrality with respect to operating versus capital cost decisions. Furthermore, it complements PPS operating cost incentives, and encourages decisions that are sensitive to market conditions.

Alternative Four: Special Capital Component Treatment/Distinguish Between Fixed and Moveable Equipment—Under the fixed/moveable equipment approach, moveable equipment costs would be incorporated in the DRG payments using a fixed percentage or flat dollar amount add-on to the standardized amounts. Building and fixed equipment costs would be paid on a hospital-specific basis during the transition period.[14]

[14]In discussing this approach, "moveable equipment" refers to major moveable equipment. It reflects capital that is purchased and turned over relatively frequently and may often be interchanged with labor or other operating costs. "Fixed equipment," includes land, buildings, fixed equipment and betterments and improvements. It cannot be readily relocated or converted to other uses.

The fixed/moveable equipment approach provides some neutrality in capital/operating cost trade-offs. Moveable equipment may be subject to capital/operating cost substitution. Since this component would be part of an all-inclusive DRG payment, there should be no differentiation between equipment and operating costs in the DRG payment. Hospitals that have recently completed major renovation projects and have high fixed capital costs may experience reduced financial stress since these costs would continue as a pass-through.

It may be difficult to monitor the classification of assets for these two categories since current Medicare guidelines for equipment classification are subject to interpretation. The fixed/moveable approach could be implemented quickly, however.

Commission's Recommendation for the Method of Capital Payment (Recommendations 5 and 6)—All-inclusive prospective prices combining operating and capital cost components should be implemented in a single prospective payment per case for hospitals. The federal portion of capital payments should be computed as a fixed percentage add-on to the standardized amounts. When appropriate data become available, the components of PPS payments should be recomputed to reflect the addition of capital costs.

Transition to the Capital Payment System.—Due to the long-term nature of capital expenditures, the transition period may significantly affect many hospitals. The development of a capital payment transition plan must address three components: 1) the duration of the transition period; 2) the blend, or the amount of hospital specific and national amounts reflected in payments during each year of the transition; and 3) the basis for computing hospital-specific costs during the transition. The goal of the transition period is to progress as quickly as possible to a federal payment for capital without creating undue hard ship for a hospital because of current obligations or its current position in the capital investment cycle (e.g., investment in very recent major projects).

Duration of the Transition Period—A short transition period would bring Medicare capital expenditure growth under control quickly, provided that the method of payment supports this. This approach, however, may have severe financial impact on hospitals. A short transition period could leave some hospitals unable to respond to and absorb the changes in payment. For example, with a sudden transition to an all-inclusive payment, hospitals having recently completed major construction may find themselves at a financial disadvantage.

A short transition period could also provide administrative simplicity and predictability of payments. By moving quickly to a new capital payment system, fewer resources are required to monitor the phase-in and the transition may be less confusing. Moreover, since control over capital growth may be realized sooner, a short transition would provide greater predictability of payments. Finally, a short transition would provide more in Medicare payments sooner for low capital cost hospitals.

A lengthy transition period would prolong the lack of control over Medicare capital expenditures. It would, however, provide hospitals more time to respond to the capital payment system. In addition, some hospitals have just started to realize the cost of some major capital projects that were obligated prior to the introduction of PPS.

A lengthy transition may be administratively complex, depending on the specific characteristics of the transition. Also, since this option would prolong reduced control over capital expenditures, it would reduce the predictability of payments for the short-term.

The capital payment transition plan could treat fixed and moveable equipment separately. For example, the plan could include capital-related costs of moveable equipment immediately and establish a reasonably long transition period for fixed plant and equipment, which are more long-term costs.

Blend Of Hospital-Specific And National Capital Payments—The transition method could weight the blend more heavily to hospital-specific costs in the early years of transition. An example of this is a payment of 95 percent hospital-specific costs and 5 percent national rates in year 1 of the transition, 85 percent hospital-specific and

15 percent national rate in year 2, 70 percent hospital-specific in year 3, 50 percent hospital specific in year 4, 25 percent hospital-specific in year 5, and 0 percent hospital-specific (100 percent national rate) in year 6. By favoring the hospital-specific capital payment in the early years of the transition, hospitals are given more time to respond to the impact of new capital payment policy.

Alternatively, the method could establish an even blend of hospital-specific and national rates over the selected time period. An example of this is 80 percent of hospital-specific costs in year 1 and 20 percent national rate, with the hospital-specific portion declining 20 percent every year and the national rate increasing 20 percent every year, until year 5, which is 100 percent national rate.

Computing Hospital-Specific Costs During the Transition—There are several alternatives for computing hospital-specific costs. First, the hospital-specific portion could be set at the level of capital costs expensed during the base year for federal capital payments. Hospital-specific payments would be based on the level of capital expenditures existing for each hospital in the base year and trended forward for years following.

Alternatively, the hospital-specific amount could be based on estimates of the hospital's current capital expenditures. The hospital-specific portion of payment would be based on the hospital's actual capital expenditures for each year of the transition. In other words, the hospital component of capital payments during the transition would represent a pass-through of capital costs.

Finally, the hospital-specific payments could be set at an amount which is an average of capital costs for several recent years. For example, the hospital-specific portion of payment could be determined by averaging the estimated capital expenditures for each hospital for the period 1984-1986 and trending this amount forward for the years following.

Commission's Recommendation for the Capital Transition (Recommendation 8)—Transition to federal capital payments under PPS should include the following provisions:

- There should be no transition for moveable equipment.
- Payments for fixed plant and equipment should be phased in over a 7 to 10 year period on a straight line basis.
- For plant and fixed equipment, hospital-specific capital payment portions should be the actual costs incurred during each year of the transition.

Commission Approach to Return on Equity and Interest Offsets.—

Return on Equity—Medicare currently pays investor-owned hospitals a return on equity capital. The purpose of this payment is to provide a return on the owners' investment. Current estimates of Medicare payments for return on equity total $300 million and represent approximately 7 percent of capital payments to hospitals.

The Commission considered three options:

1. the possibility of the amount's inclusion in the calculation of the baseline for the Federal capital payment portion;
2. the possibility of the amount's inclusion in the hospital-specific capital payment portion during the transition; and
3. addition of the amount to the hospital-specific component of operating payments, then a phase-out of this amount under the same transition schedule as PPS operating payments.

Interest Offsets—Medicare requires that interest expense be reduced by interest income earned by the hospital, except interest earned on funded depreciation, restricted funds, and donations. Interest earned on funded depreciation, restricted funds, and donations is estimated to be $50 to $90 million.

Here, too, the Commission considered three options:

1. reflection of offsets for all interest earned, except interest on funded depreciation and donations, in the baseline for federal capital payments;
2. expansion of the interest offset policy to reduce Medicare capital payments by *all* interest earned when determining the baseline for federal capital payments (including in-

terest earned on funded depreciation and donations); and
3. ignoring of any offsets in the baseline for Federal capital payments. (This option increases the amount of the baseline.)

Commission's Recommendation for Return on Equity and Interest Offsets (Recommendation 8)—The addition of capital to the Federal standardized amounts should reflect base year treatment of return on equity and interest offsets. Return on equity payments should be added to the hospital-specific portion of operating payments. Once the transition to national rates for operating payments ends, there should be no hospital-specific payment for return on equity.

Commission Consideration of Other Issues.—In addition to its exploration of the foregoing capital-related issues the Commission reviewed several others, but did not make any specific recommendations related to them.

Replacement Cost Depreciation Versus Historical Cost Depreciation—Medicare currently reimburses hospitals for depreciation expense based on the historical cost of assets. Paying replacement cost depreciation represents a prepayment of the eventual cost of replacing the asset (which increases over time due to inflation). If replacement cost depreciation were adopted, the base of assets on which to calculate the amount would need to be estimated. For example, replacement cost depreciation could be calculated based on estimated needed assets, current asset levels, or some other level. The Commission's capital recommendations do reflect payment of capital costs on the basis of historical cost calculations.

Revaluation of Assets—For the purposes of depreciation, the value of an asset is usually based on its original purchase price. Prior to 1984, Medicare allowed assets to be revalued when sold and the sales price became the base for asset depreciation (as long as it did not exceed the replacement cost for the asset). As a result of the Deficit Reduction Act of 1984, however, most assets may not be revalued upon acquisition or sale. ProPAC discussed whether to reflect the policy of revaluation of assets acquired prior to 1984 in the base for capital payments. Options reviewed were:

1. *Inclusion of depreciation on revalued assets acquired prior to 1984 in the hospital-specific portion of capital payments.* During the transition, depreciation on revalued assets for the hospital-specific portion of capital payments would continue to be paid.
2. *Inclusion of depreciation on revalued assets acquired prior to 1984 in the baseline for federal capital payments.* When calculating the federal capital payments, an amount which represents depreciation expense on revalued assets would be included.
3. *Exclusion of payment of depreciation expense that is based on the revaluation of assets for the: a) hospital specific portion, or b) the federal portion of capital payments.* For the hospital-specific and/or federal portion of capital payments, the amount estimated to be attributable to depreciation on revalued assets would be excluded.

Old Versus New Capital—Some individuals believe that capital investments made before the effective date of a new capital payment policy ("old capital") should be treated differently than those occurring after the policy was implemented ("new capital"). The Commission reviewed two options:

1. *A distinction between old and new capital in the payment mechanism and reimbursement of these expenditures differently.* For example, old capital might continue to be reimbursed on a reasonable-cost basis for the remainder of its useful life; new capital might be included in the payment mechanism immediately.
2. *Inclusion of all capital expenditures in the payment mechanism.* All capital expenditures would be reflected in the baseline for payment, regardless of their acquisition date.

Health Planning—The Section 1122 regulatory program, authorized by the Social Security Act, was introduced in 1972 to control Medicare capital payments. The role of health planning may be directly influenced by the capital payment system adopted. A capital payment system that provides incentives for cost-effective decision making by hospital managers may eliminate or reduce the need for federal health planning. The Commission considered:

1. *Continuation of the Section 1122 program for health planning and regulation of capital expenditures.* The 1122 review program would be maintained as a mechanism for controlling Medicare capital payments.
2. *Discontinuation of the Section 1122 program and, instead, reliance on the new capital payment policy to regulate capital expenditures.* Hospital managers would be relied upon to influence the capital payment mechanism in order to control Medicare capital expenditures.
3. *Modification of the focus of the Section 1122 program in order to support the needs arising as a result of changes in capital reimbursement policy.* The 1122 review program would be continued, but with a different focus, such as other health planning activities, data collection, research, and dissemination of purchaser information.

DISPROPORTIONATE SHARE HOSPITALS

In ProPAC's 1985 Report to the Secretary of Health and Human Services, the Commission recommended that the Secretary develop a definition for disproportionate share hospitals and then create an adjustment in PPS payments to those hospitals to reflect their higher costs per Medicare patient.

After the publication of the Report, the Commission continued its analytic work on this issue, working closely with the Congressional Budget Office, which held the primary responsibility for advising Congress on the issue. ProPAC proceeded to convene a technical advisory group to provide the most current information regarding costs of hospital care to the poor. The advisory group was composed of representatives from the American Hospital Association, Congressional Budget Office, Congressional Research Service, National Association of Public Hospitals, D.C. Hospital Association, and the Health Care Financing Administration.

Both the House Ways and Means Subcommittee on Health and the Health Subcommittee of the Senate Finance Committee held hearings on disproportionate share hospitals in the summer of 1985. The Congressional Budget Office provided both Subcommittees analyses of adjustment options. The Subcommittees also requested and received the results of ProPAC technical analyses.

The House and the Senate passed separate adjustments for disproportionate share hospitals, and an alternative adjustment was included in the Conference Report on H.R. 3128, Consolidated Omnibus Budget Reconciliation Act of 1985. The Conference agreement, however, was not passed; therefore, at this writing, no disproportionate share adjustment is in effect.

On December 31, 1985, the Department of Health and Human Services published in the *Federal Register* a notice regarding the definition of disproportionate share hospitals. The notice specifically omitted outlining an adjustment. The definition is extremely restrictive and not responsive to the problems that had been previously identified by the Commission and others.

Because ProPAC remains convinced of the need for an adjustment to disproportionate share hospitals, the Commission has repeated its recommendation regarding a disproportionate share adjustment for hospitals in this year's report. While the Commission acknowledges the difficulties of analysis on this issue, it believes that enough information does exist to make an adjustment both feasible and justified.

The following represents a summary of the issues and ProPAC's analytic work related to disproportionate share hospitals since the April 1985 report.

Issues Related To Developing a Disproportionate Share Adjustment

Availability of Data Upon Which To Base a Disproportionate Share Hospital Adjustment

Limited data are available for analyzing the disproportionate share hospital issue. Until recently, the 1981 Medicare Cost Report file was the most recent Medicare cost data. The American Hospital Association's Annual Survey is currently the only available ongoing data source on Medicaid utilization (admissions and days) for the nation's hospitals.[15]

The AHA also collects information on the proportion of a hospital's gross revenues that are related to Medicaid and uncompensated care (bad debt and charity care). Instead of releasing confidential data, AHA has created a matrix showing the correlations between various hospital characteristics and the proportion of gross revenues accounted for by Medicaid and uncompensated care for hospitals reporting the information on the Annual Survey.

Since states have different standards for Medicaid eligibility, hospitals in states with more restrictive income standards for eligibility may be

[15]The 1984 Medicare Cost Report requires the collection of Medicaid utilization data, but a complete set of 1984 Cost Reports for the nation's hospitals is not expected to be available until March 1986 at the earliest.

serving a large number of low income patients not reflected in data on Medicaid revenues or utilization. To adjust for differences in state Medicaid programs, data from the 1980 Census and from the Medicaid State Tables (HCFA 2082) can be used to adjust hospital Medicaid utilization data for variations in state Medicaid eligibility standards.

HCFA staff have also discussed the possibility of using Census and Medicare data to estimate the proportion of each hospital's patients which are low-income elderly. This information would not be available in time to develop a disproportionate share adjustment for the fiscal year 1986 rates. CBO, however, has used the Medicare History File to estimate the proportion of low-income elderly patients served by hospitals. The Medicare History File is an ongoing sample of persons who have ever been enrolled in the Medicare Program beginning in 1974. CBO has used this file to estimate the proportion of each hospital's Medicare patients whose Medicare Part B premiums are paid for by a state Medicaid program.

Selection of a Proxy To Measure the Volume of Low-Income Patients

Hospitals generally do not collect data on the income of the patients they serve. Instead, a substitute (proxy) measure is needed to estimate the volume of low-income patients. Ideally this proxy measure would correlate highly with patient income and therefore could be used to analyze the relationship between Medicare cost per case and service to a disproportionate share of low-income patients.

ProPAC staff and the technical advisory group considered four alternative measures upon which to base a low-income disproportionate share adjustment. These alternatives relate to the primary source of payment for the patients' care:

1. Medicaid, bad debt and charity care charges as a percent of all gross revenue.
2. Medicare low-income patients only.
3. Medicaid patient volume (admissions or days) as a percent of total volume (all admissions or days).
4. Medicaid volume combined with Medicare low-income volume.

Following is a brief description and summary of the advantages and disadvantages of each of these four alternative methods of determining whether a hospital serves a disproportionate share of low income patients.

1. Medicaid Patient Revenues Combined With Bad Debt and Charity Care

Uncompensated care is generally defined as hospital charges related to patients who either do not pay their bills (bad debts) or who cannot pay their bills (charity care). The proportion of bad debt can vary across hospitals because hospitals measure it differently. In particular, most experts agree that the majority of bad debts are likely to be generated by patients who cannot pay and that these debts really reflect charity care. The volume of hospital bad debts also vary due to differences in hospital bill collection practices.

Advantage.—

- The sum of Medicaid, charity care, and bad debt as a percent of all gross revenues is likely to be a more inclusive measure of low-income patients than one based on Medicaid patients alone or on a combination of Medicaid and low-income Medicare patients.

Disadvantages.—

- Most hospitals do not report uncompensated care charges on the AHA Annual Survey, the only industrywide survey available. Slightly less than half of all the hospitals that submitted a Medicare Cost Report in 1981 supplied data on uncompensated care in the Annual Survey.
- Even when data are reported, they are not readily available because hospital responses on the AHA Annual Survey to questions about uncompensated care, charity care, and bad debt are treated as confidential by the AHA. This would impede using the individual hospital data necessary for setting federal policy.
- Estimates of a disproportionate share effect based solely on hospitals reporting bad debt and charity care may overstate the size of the effect if such estimates are based on the 1981 Annual Survey data. This could be due to differences between the types of hospitals that reported charges for bad debt and charity care and those that did not. Using all hospitals that

reported their Medicaid volume in the AHA's Annual Survey, ProPAC staff estimate the effect of Medicaid volume on Medicare cost per case to be half that estimated using only the subset of hospitals reporting bad debt and charity care.

- Implementing an adjustment based on bad debts could provide an incentive for hospitals to reduce their collection efforts or permit them to increase Medicare reimbursement by altering accounting practices. This concern might be addressed by requiring uniform, audited accounting and bill collection procedures for all hospitals.

2. Medicare Low-Income Volume Only

Two approaches have been suggested for deriving a measure of Medicare low-income patients. In the first approach, Census data would be combined with Medicare patient origin data to obtain an estimate of the low-income elderly population served by each hospital. The feasibility of this approach is currently being explored by HCFA. According to HCFA staff, it would take at least four to six months to develop this measure.

An alternative method of measuring low-income Medicare has been developed by CBO. They identified low-income Medicare patients whose Medicare premiums were paid by Medicaid. CBO created a measure of the portion of a hospital's patients whose Medicare premiums were paid by the Medicaid program. Because the Medicare History File is a 5 percent sample of beneficiaries, it was necessary to use data from 1974 to 1981 to calculate each hospital's low-income Medicare population.

Advantages.—

- This measure addresses what some perceive as the major purpose of the disproportionate share adjustment, namely, the provision of extra funds to hospitals whose costs are higher due to serving a relatively high proportion of poor Medicare patients. According to this view, poor Medicare patients may be more severely ill than the average Medicare patient even after adjustments for case mix and other PPS payment variables. As a result, a hospital may incur higher costs than average when it serves a higher fraction of poor Medicare patients. Medicare should compensate hospitals for these extra costs until an appropriate severity measure can be developed.
- It would be feasible to make an interim adjustment for low-income elderly in the fiscal year 1986 rates using the CBO measure.

Disadvantage.—

- This measure would not provide additional payments to hospitals with higher overhead and other expenses incurred while serving a high volume of low-income patients not eligible for Medicare. These higher costs may be related to the need for specialized workers (e.g., translators, larger social work staff) and the environmental factors facing such hospitals (e.g., the need for greater security). The precise reasons for these higher costs are still unknown. Nevertheless, these costs historically have been allocated to Medicare patients through standard accounting principles and thus, they have been accepted as legitimate costs by the Medicare program.

3. Medicaid Volume Only

Medicaid volume can be measured by either days or admissions. Since PPS pays on a per admission basis, admissions may be a better measure on which to base a disproportionate share adjustment. Medicaid days, however, are more likely to reflect differences in costs related to longer lengths of stay for these patients because they are more likely to be severely ill or to be difficult to place at discharge.

Advantages.—

- Medicaid volume data are currently available for almost all hospitals in the AHA Annual Survey providing a reliable basis for estimating the relationship between Medicare costs and Medicaid volume.
- Beginning in 1984, Medicaid patient volume measures will be reported on Medicare Cost Reports. A full set of these reports will not be received in HCFA's Central Office until March 1986, at the earliest.

Disadvantages.—

- The correlation between Medicaid patients and the low-income population varies considerably

across the states due to differences in state eligibility requirements. Adopting a disproportionate share adjustment based on Medicaid volume alone would not adequately recognize the volume of the low-income patients of certain hospitals in states with restrictive Medicaid eligibility requirements. Medicaid measures can be adjusted for variations in state eligibility criteria but such adjustments are imperfect.

- A disproportionate share adjustment based on Medicaid volume alone would exclude a significant number of hospitals identified as serving a disproportionate share of low-income patients, as measured by charity care and bad debt. For example, CBO estimates that a disproportionate share definition that includes the top 20 percent of urban hospitals when ranked by Medicaid days would exclude 18 percent of the top hospitals ranked by the sum of Medicaid, bad debt, and charity care.
- This measure would not adequately reflect a hospital's low-income elderly patient volume, since hospitals generally record these admissions by their primary source of payment, Medicare.

4. Medicaid Volume Combined With Low-income Medicare Volume

Advantages.—

- Because it includes both low-income elderly and non-elderly patients, a combined measure provides a closer approximation of hospitals' low-income patient volume than only Medicaid. In particular, it recognizes low-income Medicare patients.
- Combining Medicare low-income and Medicaid volume data reduces the problems associated with variations in Medicaid eligibility because Medicaid eligibility for the elderly is more uniform across the states.

Disadvantage.—

- As with the Medicaid measure alone, hospitals with many indigent, uninsured patients, but few Medicaid patients might not receive an adequate adjustment.

Medicare Patients Inclusion in the Definition of a Disproportionate Share Hospital

In its April 1985 Report, the Commission noted that most of the disproportionate share hospital studies showed no statistical relationship between Medicare volume and Medicare cost per case. ProPAC staff analyses confirm this finding, and therefore, Medicare volume is not included as a separate factor in its disproportionate share analyses.

ProPAC Staff Analyses

In response to the Commissioners' request, ProPAC staff was asked to perform preliminary analyses of disproportionate share hospitals to determine how an adjustment might be developed.

Data Base

A data base was created by merging the American Hospital Association's Annual Survey with the 1981 Medicare Cost Reports. Of a total of 5,630 hospitals for which 1981 Medicare Cost Reports exist, 1,303 were excluded from the ProPAC data base for the following reasons:

Reason	*Number*
No matching AHA record	60
Not a community hospital	71
Exempt from PPS	129
Hospitals did not submit Medicaid data on AHA survey	1,043

This left a total of 4,327 hospitals, or approximately 77 percent of the hospitals which reported Medicare costs in 1981.

ProPAC's Choice of a Low-Income Measure

In its April 1985 Report, the Commission recommended that a disproportionate share hospital adjustment reflect the impact of serving *all* low-income patients rather than low-income *Medicare* patients. For this reason, Medicaid was subsequently chosen as a proxy measure for low income because direct measures of low income patients in hospitals were not available. Moreover, studies have shown an association between a hospital's proportion of patients that are Medicaid

and its Medicare cost per case. ProPAC staff therefore used Medicaid admissions as the proxy measure of a hospital's low-income patient volume. Medicaid days were considered but not chosen because some state Medicaid programs limit the number of days of inpatient care that will be reimbursed per admission. As a result, total days for these patients may not be reflected in a hospital's report of Medicaid days. Admissions as the proxy measure is also consistent with the per case orientation of PPS.

The proportion of each hospital's admissions that were Medicaid patients was adjusted to reflect variations in Medicaid eligibility across the states. This was necessary because hospitals in states with limited Medicaid eligibility would, in general, treat more indigent, uninsured patients than would hospitals in states with broader coverage of the low-income population.

The adjustment for variations in eligibility was a ratio that represented the extent to which that state's low-income, non-elderly population receive Medicaid relative to average national coverage for this population. Specifically, the numerator of the ratio was the portion of a state's low-income, non-elderly population receiving Medicaid. The denominator was the average portion of low-income, non-elderly receiving Medicaid across all states. This adjustment was applied by dividing the hospital's proportion of Medicaid admissions by the ratio.

Analytic Findings

To determine the type and degree of the relationship between serving a disproportionately large share of low-income patients and Medicare cost per case, the staff used statistical methods (multivariate regression analysis) which hold constant the effects of other factors, such as case mix and bed size. The relationship between Medicare cost per case and any proxy measure for low-income patients depends on the number and type of other factors held constant. Some researchers have suggested that only the PPS payment variables (e.g., case mix, area wage index, teaching activity) should be held constant. They argue that only these factors are acknowledged by HCFA as appropriate for defining payment variations. Others have suggested that a broader range of factors should be included, namely those factors which either theoretically or empirically have been shown to affect hospital costs. After extensive discussion of this issue, the ProPAC Technical Advisory Group recommended that the ProPAC analyses hold a broad set of factors constant. These were: 1) PPS payment variables, 2) hospital bedsize, 3) city size, 4) region, and 5) ownership of hospital (public or other).

The results of the ProPAC preliminary anayses are as follows:

- For all hospitals, Medicare operating costs per case rise by 0.2 percent for each 10 percent increase in the proportion of Medicaid patients. For an average hospital, this implies that an increase from 10.7 percent Medicaid patients to 13 percent Medicaid patients would increase costs per case by $4.
- It also appears that the effect is substantially larger for hospitals in which Medicaid admissions account for 10 percent or more of all admissions. In other words, there appears to be a threshold below which the relationship between Medicaid admissions and Medicare operating costs per case is not significant.
- The relationship between Medicaid admissions and Medicare costs has much more significant effect on urban hospitals than rural hospitals.
- In rural hospitals, the relationship between Medicaid admissions and Medicare operating costs per case appears to be considerably different; for these hospitals the threshold of Medicaid admissions, where costs per case begin to rise significantly, may be as high or higher than 50 percent.

Illustrations of Broad Options For a Disproportionate Share Hospital Adjustment

In deciding on a disproportionate share adjustment, two choices must be made: 1) the appropriate proxy measure, and 2) whether to make an adjustment for all hospitals or for only a subset of hospitals.

If the choice were made to use Medicaid data alone as a proxy for low-income patients, at least two types of broad options could be considered:

- An adjustment to the federal standardized amount for all hospitals based on their Medicaid patient volume.
- An adjustment for only those hospitals demonstrating large increases in operating cost resulting from service to a relatively high volume of Medicaid patients.

1. Percentage Increase in the Federal Standardized Amount for All Hospitals

The federal standardized amount could be increased for all hospitals depending on the portion of their patients who are Medicaid recipients. All hospitals would receive some increase in their federal amount, with the percentage increase being greater for hospitals with higher portions of Medicaid patients.

Advantage.—

- An adjustment to the federal rate for all hospitals avoids "boundary" issues that arise when only a subset of hospitals are given an adjustment. That is, it avoids the equity problems associated with providing an adjustment to hospitals which are just above a certain threshold proportion of Medicaid patients or are classified as a certain type of hospital (e.g., urban hospitals) while other hospitals which are either just below the threshold or just outside a geographic boundary would receive no adjustment.

Disadvantages.—

- An adjustment for all hospitals would not target assistance to hospitals most affected by high volume of low-income patients. As a result, hospitals most severely affected by a high volume of low-income patients might not have their rate increased sufficiently to compensate for the costs associated with these patients. As shown in the table below, the amount of an adjustment would be relatively small even for hospitals with very large portions of their patients drawn from the Medicaid program.
- As with any alternative based on Medicaid patient volume, some hospitals with substantial numbers of indigent, uninsured patients may not be adequately compensated for serving these patients.

2. Targeted Assistance to a Subset of Hospitals

To better target assistance to those hospitals experiencing the greatest increase in costs due to low-income patient volume, a subset of hospitals could be identified. There are several criteria that could be used to identify hospitals having the greatest increase in Medicare operating costs due to a high volume of low-income patients. One option for targeting assistance would be to provide an adjustment for the top 50 percent of urban hospitals as ranked by Medicaid patient volume (i.e., urban hospitals above the median Medicaid proportion). This option would result in approximately 1,000 hospitals receiving an adjustment. The percentage adjustment would be less than one percent for hospitals near the median Medicaid proportion and would be higher for hospitals with higher Medicaid proportions.

Advantage.—

- Limiting the disproportionate share adjustment to urban hospitals targets the adjustment to hospitals that demonstrate significantly higher costs associated with low-income patient volume. Compared to an adjustment applied to all hospitals, a targeted adjustment would provide greater compensation to those hospitals meeting the threshold, as shown in the table below.

Disadvantage.—

- Limiting the adjustment to a small subset of hospitals would exclude all rural hospitals, many of which have relatively large Medicaid patient volumes and which consequently may believe they are receiving unequal treatment.

Payments to hospitals for the disproportionate share adjustment would be very different under the two alternatives. The following table shows a comparison of payments under the two options:

Proportion of Medicaid	*Adjustment Applied to All Hospitals*	*Adjustment Applied to Urban Hospitals Above the Median*
10%	$ 4	$ 64
20%	8	260
30%	12	382

Commission Decisions

ProPAC's review of the foregoing considerations culminated in the following decisions regarding the definition and measurement of the disproportionate share population, the targeting of the adjustment, and its funding level:

- Definition and Measurement of the Disproportionate Share Population—The definition should be based on a proxy measure for *all* low-income patients. This proxy should be calculated using: 1) the proportion of Medicaid patients per hospital under age 65, adjusted for variations in the extent of coverage of the low-income population by a state's Medicaid program, and 2) an estimate of low-income elderly patients whose medical care is financed by both Medicaid and Medicare.
- Targeting the Adjustment—The adjustment should be paid to that subset of urban hospitals which is shown through analysis to have higher Medicare costs resulting from service to a high percentage of low-income patients. A threshold should be used in determining which hospitals will receive an adjustment so that the adjustment is targeted to those hospitals where there is a significant impact. For example, above a minimum volume of low-income patients, the hospital would receive a gradually increasing adjustment up to a maximum.
- Funding—The adjustment should be budget neutral; the dollars allowed in the adjustment should not be added to the prospective payment system, but rather should be redistributed from within the total.

LABOR MARKET AREAS-AREA WAGE INDEX

The current area wage adjustment under PPS is designed to account for differences in hospital costs that occur because of differences in the cost of labor inputs in different labor market areas. However, studies have shown that substantial differences continue to exist in the cost of labor inputs within current hospital labor market areas. Thus in its April 1985 Report, ProPAC made the following recommendation for dealing with the problem of wage variation within current labor market areas:

> In order to better reflect hospital labor markets, the Secretary should improve, as soon as possible, the current definition of hospital labor market areas used to adjust PPS rates for area wage differences, taking into account variations in wages paid in the inner city compared with suburban areas within a metropolitan area, and variations paid in different rural locations within a state. Implementation of this recommendation should not result in any change in aggregate payments.

Some of the reasons for observed differences in the cost of labor within current labor market areas result from differences between hospitals in: a) skill mix, b) intra-industry competition, c) inter-industry competition, and d) staffing practices.

Skill-mix differences occur because some hospitals within a labor market may provide services that require a different mix of labor skills, on average, when compared to other hospitals in the same labor market. Intra-industry competition, i.e., competition from other hospitals, may be based on factors such as location that selectively reduce the available supply of employees for some hospitals, thus affecting the relative cost of labor in different areas within the same labor market. Inter-industry competition, i.e., competition from other health-related providers, such as nursing homes and physicians' offices, as well as competing non-health-related industries, may differ between areas within the same labor market, thus affecting the opportunity costs for hospital labor. Differences in staffing practices can occur because some hospitals within a labor market choose to offer a more costly mix of labor skills to their patients.

Ideally, hospital labor market areas should be defined in such a way that all the hospitals within a particular area face the same (or similar) conditions for obtaining access to the local supply of labor. However, without some method of distinguishing between factors that are *within* hospital control and factors that are *beyond* hospital control, observed differences in hospital wage rates may be misinterpreted.

The following concerns continue to bear upon the analysis of hospital labor market areas:

1. The amount of variation in average hospital wages within current urban and rural hospital labor market areas.
2. Other limitations, unrelated to the definition of labor market areas, in the current area wage adjustment.

Wage Variation in Alternative Labor-Market Areas

Prior to 1986, no study had demonstrated the extent of wage variation in all of the urban and rural labor markets or the sources of the variation.

Using average gross wage data from HCFA's 1982 survey of hospital wages, ProPAC found that the current labor-market areas explain 62 percent of the variation in hospital wages. This total explained variation of 62 percent can be separated into three components: a) 28 percent due the urban/rural split alone, b) 25 percent due to the 315 urban areas, and c) 9 percent due to the 48 rural areas.

In urban areas, a small improvement in explained variation was achieved by dividing the 100 most populous MSAs into central cities and surrounding counties.

In rural areas, a comparable modest improvement in explained variation was achieved by using two different area definitions: a) new rural areas created from the rural portions of Bureau of Economic Analysis areas (BEAAs), and b) current rural areas divided into counties adjacent to an MSA vs. all other counties.

A model to explain the sources of wage variation in current labor-market areas is still being refined. The primary limitation of this model is the absence of accurate data concerning the mix of employees in different skill categories. As a result, it has been difficult to separate the impact of skill mix on hospital wages from the impact of community factors on hospital wages.

It has also been difficult to identify community factors except at the county level. This obviously limits the ability to measure factors that may affect the cost of labor at the local level.

Despite these limitations, the preliminary results suggest that community factors associated with increases in the wages of lower-skilled workers tend to be associated with decreases in the wages of higher-skilled workers, and vice versa. This finding suggests that it may be difficult to isolate a set of community characteristics that have a uniform impact on hospital wages.

Other Wage Adjustment Related Payment Inequities

The Commission has identified four major policy areas related to the area wage adjustment that may result in payment inequities:

- the urban/rural rate differential;
- the regional rate differentials;
- the labor/non-labor shares; and
- the skill mix of hospital employees.

Preliminary findings indicate that both the urban/rural rate differential and the regional rate differentials reflect differences in prevailing practice patterns, especially in the use of ancillary services. Further study is needed to determine the reasons for these regional differences in practice patterns.

Further study of the labor/non-labor shares should address the possibility of allowing different shares across DRGs and across hospitals. This would address the current potential incentives against: a) labor-intensive DRGs in high labor-cost areas, and b) non-labor-intensive DRGs in low labor-cost areas.

More accurate data should be collected concerning the skill mix of hospital employees. In addition, the relationship between skill mix and case mix should be further explored. However, a separate adjustment for skill-mix differences is not desirable. Instead, adjustments should be made directly for the factors that require a higher skill mix.

Finally, incentives for the long-term efficiency of the hospital industry should be improved by incorporating capital expenses into the payment rates and by studying the impact of PPS on the total costs of patient episodes of illness.

RURAL HOSPITALS: PPS PAYMENT ISSUES

Introduction

ProPAC urges completion of congressionally mandated HHS studies concerning payment policy issues related to rural hospitals. As part of its own consideration of PPS rates the Commission addressed three of those issues:

- whether separate standardized amounts for urban and rural hospitals should be maintained;
- whether current labor market areas should be refined to better reflect differences among areas within a state; and
- whether PPS is an appropriate system to pay for care in small rural hospitals.

Discussion of these issues follows. Supporting statistics are contained in Tables A-27, A-28, and A-29.

Separate Standardized Amounts

Under PPS, separate standardized amounts are calculated for urban and rural hospitals, resulting in the rural standardized amounts being consistently lower than the urban amounts. These lower amounts reflect historically lower average costs in the rural hospitals. The historic cost differences remain even after adjustments are made for area wage differences, teaching activity, and case mix.

Some have questioned the appropriateness of separate PPS payments schedules for urban and rural hospitals given the overall system design to pay a national price per DRG. They have argued that the reasons for the differences in historic costs are unknown and may partly reflect historic differences in efficiency. Accordingly, they argue that the reasons behind the historic cost differences between urban and rural hospitals need to be further examined.

Commission Analysis

The 1985 published national standardized payment amount per case for urban hospitals is 25 percent higher than for rural hospitals, reflecting the cost differences that remain between these two groups of hospitals after adjustments have been made for differences in area wages, teaching, and DRG case mix.

In addition to differences in teaching status, case mix and area wages, the higher costs in urban hospitals have partially been attributed to the larger size and wider range of services offered in these facilities compared to rural hospitals. In a recent study completed for HCFA and summarized as part of a contract with ProPAC to study labor market areas, Health Economics Research, Inc. (HER) reported that higher ancillary use in urban hospitals was the most important factor contributing to the urban/rural cost differences, after controlling for differences in area wage rates and case mix. These findings should be considered preliminary since the analysis was performed only for selected DRGs. Nevertheless, on a larger sample of hospitals, HER found that hospitals in rural counties adjacent to Metropolitan Statistical Areas (MSAs) had costs per case that were slightly higher than those found for non-adjacent counties. Longer lengths of stay and a greater number of special services accounted for most of this cost difference, while wage rates accounted for less than one-third of the difference. Together, these findings suggest that variations in medical practice patterns account for a substantial portion of the cost differences between urban and rural areas and among regions within rural areas.

Labor Market Definitions

The current PPS adjustment for variation in labor costs treats all rural hospitals in a state as a single rural area. Such an adjustment ignores differences in labor costs between rural areas within a state and ignores the problems of 'border' rural hospitals which must compete with urban hospitals for labor.

Commission Analysis

The Commission is currently engaged in a major effort to refine the definition of labor market areas in both urban and rural areas. Preliminary evidence from our studies indicates that the use

Table A-27.—Comparative Characteristics Of Urban And Rural Hospitals

Characteristic	Urban	Rural
1. Number Of PPS Hospitals 1984	2,598	2,705
2. Percent Of PPS Hospitals 1984	49.0%	51.0%
3. Number Of Medicare Cases In PPS Hospitals—1984	6,726,131	2,498,648
4. Percent Of Medicare Cases In PPS Hospitals—1984	72.9%	27.1%
5. Bedsize Distribution Of PPS Hospitals—1984		
<100 Beds	21.3%	72.9%
100-169 Beds	—	13.9%
170+ Beds	—	7.5%
100-404 Beds	52.9%	—
405-684 Beds	13.2%	—
685+ Beds	3.2%	—
6. Ownership Distribution Of PPS Hospitals—1984		
Church	18.0%	8.8%
Government	16.5%	45.0%
Proprietary	15.5%	6.7%
Other	41.2%	33.3%
Missing	8.8%	6.2%
7. Published 1985 National Standardized Payment Amounts Per Case	$2,985.05	$2,381.39
8. Estimated Hospital Specific Payments Per Case—1986	$3,981.67	$2,290.89
9. Sole Community Providers In Rural Areas (1984)		
Number	—	345
Percent of Hospitals	—	12.8%
10. Rural Referral Centers (1984)		
Number	—	140
Percent of Hospitals	—	5.2%
11. Hospitals That Are Both A Rural Referral Center And A Sole Community Provider (1984)		
Number	—	14
Percent	—	0.5%
12. Medicare Admissions As A Percent Of Total Admissions In PPS Hospitals		
1980	29.3%	35.6%
1984	33.8%	39.8%
13. Medicare Days As A Percent Of Total Days In PPS Hospitals		
1980	39.8%	45.0%
1984	42.8%	46.1%
14. Percent Occupancy		
1980	72%	61%
1984	64%	54%
15. Admission Changes: Percent Change 1983-84	−2.0%	−5.7%
16. Comparison Of Small (<50 Beds) To All Hospitals:	Small	All Hospitals
Percent Change, 1984-85 (January-June)		
Admissions	−15.7	−6.2
Total Expenses	−0.1%	+4.7%
Expenses Per Admission	+13.0	+9.4%
17. Percent Of Surgeries Done On The Outpatient Service In PPS Hospitals		
1980	15%	13%
1984	27%	24%

SOURCES: Items 1-6, 8-11—Medicare Cost Reports, MEDPAR and 1984 PATBILL files; Item 7—Published Rates from *Federal Register*, vol. 49, Jan. 3, 1984; Item 16—Kenneth Shull in Testimony before the Subcommittee on Hospital Productivity and Cost-Effectiveness, Nov. 12, 1985; Items 12-15, 17—AHA Annual Survey.

Table A-28.—Trends In Hospital Profitability Ratios

	Operating Margin Ratio				
	1980	1981	1982	1983	1984
All Hospitals	0.019	0.020	0.020	0.023	0.031
Rural	0.017	0.014	0.014	0.016	0.023
Urban	0.021	0.021	0.021	0.026	0.033
Rural <100 Beds	0.007	0.010	0.003	0.006	0.006
Urban <100 Beds	0.007	0.006	0.008	0.008	0.016
Rural 100-199 Beds	0.024	0.020	0.020	0.021	0.022

Operating Margin Ratio: (Total operating revenue − operating expenses) / Total operating revenue

SOURCES: 1) Data on all hospitals, all rural and all urban hospitals from *Measuring The Effects of PPS*, October 1985, a paper prepared for ProPAC by William O. Cleverley; 2) Data by hospital bedsize category from *Hospital Industry Analysis Report, 1980-1984*, prepared by William O. Cleverley for the Healthcare Financial Management Association, 1985.

of Bureau of Economic Analysis Areas may be a feasible approach to refining the definition of labor markets within rural areas. Some have proposed that the rural labor market definitions be refined to reflect whether a hospital is located in a county adjacent to an MSA. In the study for HCFA referenced above, HER found that in most states, wage rates were significantly higher in rural hospitals adjacent to MSAs compared to hospitals in non-adjacent counties. However, in almost one-third of the states, wage rates were lower in adjacent vs. non-adjacent rural counties. For all states, the magnitude of the average difference between wage rates in adjacent and non-adjacent counties was small.

The Appropriateness of PPS

Rural hospitals tend to be small, and those that are small are more vulnerable to the financial impact of fluctuations in volume and case mix than large institutions. For larger hospitals, minor fluctuations in volume and case mix are not as critical because the hospital can average year to year losses and gains due to volume shifts, and can average over a large number of cases the losses and gains from case to case. Small rural hospitals cannot take advantage of this 'law of large numbers.' If such fluctuations are outside the control of the hospitals, then it might be argued that special consideration should be given to these volume problems in the payment system.

Some have suggested that small rural hospitals are particularly financially vulnerable to fluctuations in their Medicare patient population since rural hospitals tend to have a relatively high volume of Medicare patients.

Others have noted that in relatively isolated areas, the hospital is the focal point for all the health care delivered to the community; if the hospital closes, much of the health care infrastructure disappears.

Nevertheless, not all rural hospitals are small and not all rural hospitals are isolated. Payment policies that are appropriate to some rural hospitals may be inappropriate to others.

Commission Analysis

Average Size of Hospitals.—In 1984, approximately 73 percent of the rural hospitals on PPS had less than 100 beds compared to 21 percent for urban hospitals. This difference in size is reflected in the distribution of Medicare cases among urban and rural hospitals. While rural hospitals accounted for over 51 percent of the hospitals under PPS in 1984, they accounted for only 27 percent of the cases.

Volume Changes.—According to evidence provided to ProPAC by the American Hospital Association, rural hospitals have experienced a substantially greater decline in total admissions during the period 1983 through the first six months of 1985 than their urban counterparts (−5.7 percent compared to −2.0 percent for the 1983-84 period; −15.7 percent compared to −6.2 percent for small hospitals—the majority of which are rural—compared to all hospitals during the first six months of 1985). This has resulted in a slight decline in overall expenses for rural hospitals but a significant increase in expenses per admission, an increase that is substantially greater than that experienced by urban hospitals during the same period.

The greater decline in total patient volume compared to Medicare volume for both urban and rural hospitals has resulted in Medicare constituting a higher fraction of all hospitals' total patient business. Between 1980 and 1984, Medicare admissions as a percent of total admissions in PPS hospitals went from 29.3 percent to 33.8 percent in urban hospitals and from 35.6 percent to 39.8 percent in rural hospitals.

Thus both urban and rural hospitals have had to spread their fixed costs over a smaller volume of total patients and a relatively higher fraction of Medicare patients. To some extent urban and rural hospitals have been able to recover these costs through increased revenue related to an increasing Medicare case mix. The case-mix index for urban hospitals, however, has risen more rapidly than for rural.

Financial Condition of Rural Hospitals.—In testimony to the Commission, Kenneth Shull, representing the American Hospital Association (AHA), noted that rural hospitals were particularly vulnerable to changes in Medicare policy because Medicare constituted a very high percentage of these hospitals' volume and revenue. As noted above, evidence from the AHA Annual Survey indicates that Medicare does constitute a higher percentage of the patient volume in rural hospitals, but the gap between urban and rural hospitals is narrowing.

According to a number of financial indicators, hospitals in rural areas have demonstrated an overall improvement in their financial position since the implementation of PPS. Following trends in the hospital industry as a whole, rural hospitals reported substantial increases in operating profitability in 1984 (as measured by the hospital operating margin ratio). Small rural hospitals did not show an increase in profitability in 1984 over 1983, but the 1983 figures represented a substantial increase over the previous year (Table A-28).

It should be noted, however, that rural hospitals and especially small rural hospitals do not show high profit margins. The poorer profitability of rural hospitals has been associated with the smaller average size of rural hospitals.

The evidence regarding the first year of PPS, however, should be viewed with caution. Given the reporting cycle of hospitals, a large number of hospitals on PPS for only part of the 1984 period reported in these analyses. Furthermore, these data provide little insight into the financial condition of hospitals under a fully implemented national PPS system.

Preliminary evidence from ProPAC's analysis of the transition indicated that compared to the average experience of all hospitals, rural hospitals will lose as PPS moves to complete federal rates. Compared to payments based on each hospital's own cost base, all hospitals would gain, on average, 4.3 percent on their per case payments under a complete federal rate. Rural hospitals, however, would gain only 1.7 percent, on average, and rural hospitals with 100 to 169 beds would actually lose 2.6 percent compared to that which would have been paid under hospital specific payments.

Finally, like their urban counterparts, rural hospitals continue to have inadequate investment levels to meet replacement of their current assets; as a result, rural hospitals may require substantial borrowing to acquire replacement assets. This level of borrowing may not be feasible in light of their financial conditions. The inclusion of capital costs in PPS payments may also impact rural hospitals ability to seek external financing. On the other hand, average occupancy in rural hospitals is quite low (54 percent in 1984), and rural hospitals may find that it is not desirable to replace all existing assets.

Sole Community Providers.—States vary significantly in the percent of hospitals that are designated under the categories of Sole Community Providers or Rural Referral Centers (see Table A-29). Further work will be required to determine whether this distribution appears reasonable, given the demographic characteristics of each state.

Table A-29.—Number Of Sole Community Providers And Rural Referral Centers In Each State, Percentage Of Hospitals In Each State, 1984

State	Sole Community Providers		Rural Referral Centers		Rural Referral Center And Sole Community Provider	
	#	% Of Hospitals In State	#	% Of Hospitals In State	#	% Of Hospitals In State
Alabama	—	—	1	0.7%	—	—
Alaska	11	42.0%	6	23.1	1	3.8%
Arizona	13	16.5	—	—	—	—
Arkansas	1	1.0	—	—	—	—
California	38	6.5	1	0.2	—	—
Colorado	17	17.3	—	—	1	1.0
Connecticut	—	—	—	—	1	1.5
Delaware	—	—	1	7.1	—	—
Florida	6	2.4	2	0.8	—	—
Georgia	1	0.5	7	3.7	—	—
Hawaii	4	15.4	—	—	—	—
Idaho	3	5.8	5	9.6	—	—
Illinois	4	1.4	4	1.4	—	—
Indiana	—	—	5	3.8	—	—
Iowa	1	0.7	5	3.6	—	—
Kansas	7	4.2	2	1.2	—	—
Kentucky	6	5.0	7	5.8	2	1.7
Louisiana	5	3.2	2	1.3	—	—
Maine	9	19.1	2	4.3	—	—
Michigan	6	2.6	5	2.2	1	0.4
Minnesota	5	2.8	2	1.1	1	0.6
Mississippi	1	0.8	8	6.8	—	—
Missouri	6	3.6	1	0.6	—	—
Montana	28	41.8	3	4.5	1	1.5
Nebraska	26	23.6	2	1.8	2	1.8
Nevada	7	26.9	—	—	—	—
New Hampshire	3	8.8	2	5.9	—	—
New Mexico	21	37.5	—	—	1	1.8
North Carolina	1	0.6	9	5.7	—	—
North Dakota	21	36.2	2	3.4	—	—
Ohio	1	0.4	11	4.7	—	—
Oklahoma	7	4.9	8	5.6	1	0.6
Oregon	11	13.3	4	4.8	—	—
Pennsylvania	1	0.3	7	2.2	—	—
South Carolina	1	1.1	2	2.2	—	—
South Dakota	15	22.1	1	1.5	1	1.5
Tennessee	2	1.2	1	0.6	—	—
Texas	11	2.0	3	0.5	—	—
Utah	12	27.3	—	—	—	—
Vermont	6	31.6	1	5.3	—	—
Virginia	6	4.4	3	2.2	1	0.7
Washington	12	9.8	4	3.3	—	—
West Virginia	3	4.0	5	6.7	—	—
Wisconsin	—	—	4	2.5	—	—
Wyoming	13	41.9	—	—	—	—

SOURCE: Fiscal Year 1984 Health Care Financing Administration Provider Specific Files.

Appendix B

DRG Classification and Weights

Appendix B

DRG Classification and Weights

INTRODUCTION

Appendix B presents background materials related to the Commission's recommendations on incremental improvements in DRG classification and calculation of payment amounts.

Among the most serious concerns about the future of PPS is the adequacy of the DRG patient classification system as a measure of a hospital's mix of cases for the purpose of determining payments.

The Commission is keenly aware of the debate regarding the current use of DRGs by the Medicare program. ProPAC's recommendations on case mix measurement, coding, individual technologies and specific DRGs collectively reflect a still evolving perception of the most appropriate approaches to problems of excessive heterogeneity within DRGs, especially heterogeneity related to case complexity and severity of illness.

ProPAC's analyses demonstrate that the current DRG system can incorporate new costly technologies such as MRI, ESWL, and implantable defibrillators, as well as respond to special problems such as the high device costs associated with increased use of sophisticated cardiac pacemakers.

At the same time, the Commission is convinced of the need for a thorough evaluation of the use of DRGs as a measure of case mix. This includes the system's interaction with such other PPS issues as adjustments for differences in local wage rates, outlier payments, calculation of the standardized amount, and geographic variations in practice patterns.

Following this introduction is a list of topics currently under review that were identified by the Commission or outside groups as possibly needing DRG classification or payment amount adjustment. A second list follows, consisting of topics examined but currently not under review because of a determination that recalibration of DRG weights will correct the problem, the number of cases is small, or the service is currently not covered by the Medicare program.

The section continues with discussion of several generic issues affecting the DRGs' capacity to encompass new costly technologies and expensive devices. Cutting across all of the discussion of DRG measurement issues is the matter of diagnostic and procedural coding; the appendix offers a review of the history and current utilization of ICD-9-CM codes.

As indicated in Commission Recommendation 20, ProPAC believes that additional evaluation and analysis are necessary prior to considering whether to replace or modify the DRGs using an alternative case-mix system. The Commission intends to continue to monitor the development of alternative case-mix systems and assess their capability as a Medicare case-mix measurement system. This appendix concludes with material describing five major systems.

PROSPECTIVE PAYMENT ASSESSMENT COMMISSION

DRG CLASSIFICATION AND WEIGHT ANALYSIS

TOPICS UNDER REVIEW

Topic Number	Topic o Issue	Technology or Changing Practice Pattern	CASE MIX MEASUREMENT AND PAYMENT ISSUES: Expensive Devices	Case Complexity	Diagnostic and Procedure Coding	Other DRG Assignment Issue
24-85	ARTIFICIAL URINARY SPHINCTERS o Cases may be classified with less resource-intensive patients. o Treatment involves high prosthetic device costs.		X			
27-85	BURNS o Cases may be classified in DRGs with less resource-intense patients. Payments may be inadequate. o Certain hospitals may treat more severely ill cases.			X		
4-85	CARDIAC PACEMAKERS o Financial incentives may discourage implantation of more expensive sophisticated pacemakers. o Payments may be inequitable across hospitals. o Alternative groupings of some discharges may be more appropriate.		X		X	X
6-85	COCHLEAR IMPLANTATION o Hospital costs are likely to exceed payment under current DRG classification. o Long-term safety and efficacy are unknown.	X	X		X	

TOPICS UNDER REVIEW

Topic Number	Topic o Issue	Technology or Changing Practice Pattern	CASE MIX MEASUREMENT AND PAYMENT ISSUES			
			Expensive Devices	Case Complexity	Diagnostic and Procedure Coding	Other DRG Assignment Issue
9-85	CYSTIC FIBROSIS o Cases are classified in DRGs with less resource-intense discharges.			X		X
10-85	DERMATOLOGIC DISORDERS o Dermatology cases are in heterogeneous DRGs. o Most resource-intense cases are at tertiary care hospitals			X		
13-85	ENDOCARDIAL ELECTRICAL STIMULATION o Practice pattern change regarding evaluation and treatment of life-threatening cardiac arrythmias may change resource use.	X		X	X	
14-85	END STAGE RENAL DISEASE (ESRD) o Should "Admission for Dialysis" be listed as principal diagnosis when ESRD patients are hospitalized?				X	X
15-85	EXTRACORPOREAL SHOCK WAVE LITHOTHRIPSY o Current ICD-9 codes may be inadequate? o Proposed DRGs and weights may be inappropriate.	X				
2-86	HEART TRANSPLANTATION o Heart transplantation is currently not a Medicare covered service, although it is likely coverage will be available in the near future. o There is a heart transplant DRG, and a weight must be determined.	X				

TOPICS UNDER REVIEW

Topic Number	Topic o Issue	Technology or Changing Practice Pattern	CASE MIX MEASUREMENT AND PAYMENT ISSUES			
			Expensive Devices	Case Complexity	Diagnostic and Procedure Coding	Other DRG Assignment Issue
16-85	HEMOPHILIA o Patients may be inappropriately classified with cases that are less resource-intensive.		X	X		
3-86	IMPLANTABLE DEFIBRILLATOR o New, costly device used in the treatment of ventricular arrhythmias that may lead to sudden death. o The device will be a Medicare covered service in the near future.	X	X		X	X
25-85	INFLATABLE PENILE PROSTHESES o Cost of this device is significantly higher than alternative prostheses.		X			
18-85	LYMPHOMAS AND LEUKEMIAS o These DRGs are heterogeneous. Payments may be inadequate. o Patients on research protocols may have higher costs. o Which hospitals should qualify as exempt cancer centers?	X		X		X
19-85	MAGNETIC RESONANCE IMAGING o Does it require procedure code? o For what conditions are MRI scans indicated? o How shall payment be determined?	X				
20-85	MALIGNANT EXTERNAL OTITIS MEDIA o Certain hospitals may treat more severely ill cases.			X		

TOPICS UNDER REVIEW

Topic Number	Topic o Issue	Technology or Changing Practice Pattern	CASE MIX MEASUREMENT AND PAYMENT ISSUES			
			Expensive Devices	Case Complexity	Diagnostic and Procedure Coding	Other DRG Assignment Issue
21-85	PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY o Does it need ICD-9 codes? o Is current DRG classification appropriate?				X	X
29-85	RECONSTRUCTIVE JOINT PROCEDURES FOR PATIENTS WITH RHEUMATOID ARTHRITIS o Cases may be classified in DRGs with less resource-intense discharges. Payments may be inadequate. o Cases involving multiple joint replacements may be underpaid.			X		
22-85	SPINAL CORD INJURY o Is DRG weight appropriate? o Do referral centers see the most resource-intense cases?			X		
23-85	TOTAL PARENTERAL NUTRITION o Patients receiving TPN may have higher costs than other cases in DRG. o Does TPN need its own code?	X		X	X	

TOPICS PREVIOUSLY CONSIDERED

PROSPECTIVE PAYMENT ASSESSMENT COMMISSION

DRG CLASSIFICATION AND WEIGHT ANALYSIS

TOPICS PREVIOUSLY EXAMINED

Topic Number	TOPIC o Issues	Topic is Not Currently Under Analysis Because:
1-85	ACUTE MYOCARDIAL INFARCTION o Changes in practive patterns since 1981 may have led to a decrease in the length of stay for patients treated for AMI. Resource utilization for patients may also be lower than in 1981.	o Annual recalibration of the DRG weights should account for practice pattern change since 1981. o Because the therapy is still evolving, periodic reconsideration of this topic may be appropriate.
2-85	ALCOHOL AND DRUG DEPENDENCE o Rehabilitation and detoxification are separate treatments that use different resources. However, these cases are classified into the same DRG. o HCFA orginally exempted alcohol/drug hospitals and distinct units for one year, but extended that exemption for a second year in its September 1985 regulations.	o The proposed reclassification of the 5 substance and alcohol abuse DRGs appears to be clinically coherent and reflect more accurately the differences in resource consumption and LOS between alcohol detoxification and rehabilitation treatments. o ProPAC will continue to monitor studies conducted by others and the impact of the changes implemented by the Secretary.
3-85	BONE MARROW TRANSPLANTATION o Patients undergoing bone marrow transplantation may be grouped into DRGs with cases requiring fewer resources. o This grouping problem partially exists because there are no specific procedure codes for bone marrow transplantion. Therefore, cases are predominantly classified according to the medical conditions being treated.	o Few Medicare beneficiaries undergo the procedure. Patients over the age of 65 are presently not considered candidates for this procedure. o This topic may be reviewed again when it becomes more widely adopted.

TOPICS PREVIOUSLY EXAMINED

Topic Number	TOPIC o Issues	Topic is Not Currently Under Analysis Because:
5-85	CATARACT EXTRACTION AND INTRAOCULAR LENS IMPLANTATION o The weight for DRG 39 may not reflect the increased use of an intraocular lens following cataract removal since 1981.	o Annual recalibration of the DRG weights should account for the increased use of the intraocular lens. o Cataract extraction and introcular lens implantion should continue to be monitored to determine if the types of patients treated as hospital inpatients have changed with increased outpatient surgery.
7-85	CORONARY ARTERY BYPASS GRAFT SURGERY o Length of stay for patients receiving coronary artery bypass graft surgery may have decreased since 1981. Consequently, this procedure may be reimbursed at a higher rate relative to alternative nonsurgical therapy which may be equally as effective in many cases.	o Annual recalibration of the DRG weights should account for practice pattern changes since 1981. o CABGS should be considered as a case example in a study of practice pattern variation.
8-85	CYCLOSPORINE o As a result of the FDA approval of cyclosporine in 1983, length of stay for patients receiving organ transplants may have decreased.	o Annual recalibration of the DRG weights should account for the increased use of cyclosporine and the resulting decrease in LOS for patients receiving an organ transplant.
11-85	DIABETES o Patients with a principal diagnosis of diabetes receiving a kidney transplant are grouped into DRG 468 (Unrelated OR Procedure) instead of DRG 302 (Kidney Transplant).	o HCFA proposed in its September 1985 regulations to classify diabetic transplant patients into DRG 302.

TOPICS PREVIOUSLY EXAMINED

Topic Number	TOPIC o Issues	Topic is Not Currently Under Analysis Because:
	o The diabetes DRGs are split according to age and not complications and comorbidities.	o No reclassification is necessary for diabetes with complications and comorbidities. The current DRGs for diabetes account for complications and comorbidities.
12-85	DUAL JOINT PROCEDURES IN ONE HOSPITALIZATION o Cases involving multiple joint replacement may be underpaid. o Bilateral hip replacement and other dual joint replacements may be performed in one hospital stay for a certain subset of patients. The DRG assignment and payment is the same whether one or two joints are replaced during the stay.	o HCFA has proposed in its September 1985 regulations to create DRG 471 for multiple joint procedures. This new DRG would more appropriately reflect resource utilization when two joints are replaced.
26-85	EPIKERATOPHAKIA o New technology for treatment of certain eye conditions. o Cases may be classified into a DRG with less resource intensive patients. o There is currently no procedure code for this procedure.	o This procedure is not currently a Medicare-covered procedure. o Further analysis may be undertaken if the procedure is covered under the Medicare program and becomes more common among patients over age 65.
17-85	INFECTIVE ENDOCARDITIS o Length of stay from the 1981 MEDPAR database for patients being treated for infective endocarditis appears to be shorter than the recommended LOS for treatment.	o It appears that the arithmetic mean length of stay for patients being treated for infective endocarditis was appropriate. o There was some confusion between the arithmetic and geometric means.

TOPICS PREVIOUSLY EXAMINED

Topic Number	TOPIC o Issues	Topic is Not Currently Under Analysis Because:
28-85	THORACO-ABDOMINAL AORTIC ANEURYSM RESECTION o Costly, new surgical procedure. o Cases may be classified in DRGs with less resource-intensive patients.	o Procedure performed on a small number of individuals. o Use this procedure as an example in staff work related to severity of illness and diagnostic and procedure coding.
1-86	HYPERTHERMIC ISOLATED PERFUSION o New, more costly treatment for certain malignancies of the extremeties, currently not covered by Medicare. o Diagnostic and procedural coding may be inadequate to identify the procedure.	o Procedure is not a Medicare-covered service.

PAYING FOR COSTLY NEW TECHNOLOGIES UNDER MEDICARE'S PROSPECTIVE PAYMENT SYSTEM

Concern has been raised that the financial incentives of PPS may have an adverse impact on the development, adoption, and diffusion of costly new medical technologies. Three major questions embody this concern:

1. How might the new hospital and manufacturer incentives under PPS affect the development, adoption, and diffusion of new medical technologies?
2. Are the current PPS mechanisms to create timely and appropriate payments adequate to allow the development, adoption, and diffusion of costly new medical technologies?
3. If current provisions are inadequate, what other mechanisms might be available to encourage the development, adoption, and diffusion of costly new medical technologies?

These matters overlap to some extent with those addressed in other ProPAC analyses. The goal in what follows, however, is to examine the unique problems facing technologies that are both new *and* expensive; PPS issues surrounding *established* implantable devices (for example, pacemakers) are being examined in the analysis of expensive devices. Similarly, less expensive but cost increasing technologies are dealt with as part of the allowance for scientific and technological advances in the Discretionary Adjustment Factor (DAF). Finally, what follows is devoted almost entirely to evaluating the operating costs associated with new technologies. ProPAC analyses concerning the incorporation of capital payments into PPS are presented in Appendix A.

The Impact of PPS Incentives on the Development, Adoption, and Diffusion of New Medical Technologies

The purchasers and manufacturers of medical technologies face an entirely new set of financial incentives under PPS. Upon recognizing these constraints within the payment system, hospitals and manufacturers may alter their decisions regarding new medical technologies.

Hospital Incentives

Hospitals now share financial risk in caring for Medicare beneficiaries. These providers must therefore make careful decisions when purchasing new medical technologies. The financial incentives of the system will encourage hospitals to purchase new technologies that:

- Decrease the total costs of care per admission.
- Increase admissions for some profitable cases and decrease admissions for other cases.
- Shift services to alternative sites in some cases.

Similarly, the financial incentives discourage hospitals from purchasing quality-enhancing technologies that increase costs per discharge, even if the technologies are cost-effective in the long run. On the other hand, additional factors (for example, interest in providing quality care and attracting patients) may lead hospitals to purchase some of these cost-increasing technologies. The critical issue for this analysis is whether adjustments are necessary in PPS to provide financial incentives for the development and purchase of costly new medical technologies.

Manufacturer Incentives

Manufacturers are encouraged to develop the technologies that meet the hospital demands outlined above. At the earliest stages of development, therefore, manufacturers consider the marketability of new technologies. Their decisions could affect technologies along two separate dimensions:

The Types of Technologies Available to Purchasers.—Real or perceived payment inadequacies may affect the development of medical technologies along the spectrum from the least expensive hospital supplies to the most expensive, capital intensive equipment. It seems reasonable to expect, however, that the greatest impact would be on the most costly medical technologies.

The Life Cycle of Technologies.—Under cost-based reimbursement, coverage policy decisions

by third party payers generally affected technology adoption or diffusion. Under PPS, the manufacturers may also consider the expected future payment levels for a technology while it is still in the research and development stages. If they perceive that future payments will not be high enough to market the technology with an adequate profit, manufacturers may be reluctant to commit further research and development funds. Thus PPS incentives have the potential to affect new technologies throughout their entire life cycle.

Current Provisions of PPS That Affect the Development, Adoption, and Diffusion of New Medical Technologies

The Provisions Within PPS

Early in the development of PPS, concerns were raised that payments for cases involving quality-enhancing, cost-increasing technologies might lag behind the costs for those cases. As a result, the system has several provisions to encourage timely and appropriate payments for new technologies:

Recalibration (and Reweighting) of DRGs.—This provision allows payments to change periodically and therefore reflect new patterns of practice, including the use of new technologies. By law, recalibration must occur at least every four years but can be performed more often. The Commission recommends annual recalibration. (See Recommendation 14.)

Reclassification of Discharges Within DRGs.—The ability to reclassify discharges allows the system to maintain the homogeneity of DRG groupings. Reclassification can occur at the time of recalibration or more frequently. The Commission recommends, for example, reclassification of some cases currently assigned to DRG 341. (See Recommendation 28.)

ProPAC.—The Commission was created to respond to concerns about PPS and to advise the Secretary on the update factor and the necessary changes in DRG classification and weights.

Update Factor.—Medicare payments are to change each year by the amount of the update factor. Within the DAF part of the update factor, ProPAC has incorporated the concept of an additional payment in order that hospitals purchase cost-increasing, quality-enhancing technologies. (See Recommendation 2.)

Payment Adjustment for Teaching Hospitals.—Medicare pays teaching hospitals for the higher costs of care associated with graduate medical education. Some of these additional costs may be due to the hospitals' traditional role in the development of new technologies.

Outlier Payments.—Hospitals receive additional payments for cases with extraordinary lengths of stay and/or costs. Some of these cases may involve the use of new technologies.

Payment for Capital-Related Costs on a Reasonable Cost Basis.—Many costly new medical technologies involve substantial capital-related costs. Currently these are paid on a reasonable cost basis. This provision may encourage hospitals to purchase capital-intensive technologies in the short run before alternative payment mechanisms are developed for capital. (See Recommendations 5 through 8.)

Exceptions and Adjustments for Referral Centers.—The Social Security Amendments of 1983 stipulate that: "The Secretary shall provide for such exceptions and adjustments to the payment amounts . . . as the Secretary deems appropriate to take into account the special needs of regional and national referral centers . . ." Such referral centers may play a major role in use of new technologies. At this time, however, the Secretary has only made adjustments for rural referral centers by allowing them to be paid at the urban rate.

Current PPS Mechanisms to Provide Timely and Appropriate Payments for New Technologies: Potential Limitations and Countervailing Considerations

Limitations

There are several situations in which PPS payments early in the adoption of a technology, despite the efforts of HCFA and ProPAC, may be inadequate to cover actual costs. These situations

occur when data are insufficient to determine appropriate classifications and weights, or when the cases involving the new technology consistently have costs above the mean for the DRG. Examples include:

Inadequate Clinical Information To Make DRG Classification Assignments.—At the time Medicare initially pays for a new technology, some technologies may still be undergoing intense clinical investigation. Information about the technology's effectiveness relative to established alternatives may be limited. For example, Extracorporeal Shock Wave Lithotripsy (ESWL) was recently approved by the FDA and covered by Medicare for the treatment of urinary tract stones. The long-term effects of this procedure and its relative advantages over competing technologies, however, are unknown. The decisions about DRG classification and payment might have been different had such information been available.

Inadequate Cost and/or Charge Information To Set Weights.—If Medicare is to pay appropriately for a new medical technology, the system must determine the average costs of discharges in which the technology is applied. These costs, however, do not generally appear in Medicare data bases prior to the time of initial coverage. Thus, classification and weighting decisions must be based on other data sources. In some cases, such data may be unavailable or inadequate. Appropriate classification or weighting may be impossible. ESWL again provides an excellent example. Few hospitals in this country had used ESWL extensively prior to the recent FDA and HCFA decisions. HCFA and ProPAC have based all classification and weighting analyses on the limited cost and charge data from these institutions. Data collected during this research period may not reflect costs and charges during normal use of the technology.

Inability To Adjust Current Weights for All Relevant DRGs.—Some medical technologies may be used in cases that are classified into many different DRGs. Examples include magnetic resonance imaging and total parenteral nutrition. Although the average costs per procedure or costs per discharge may be known for such technologies, it may be difficult to identify all the cases in all the relevant DRGs because use of most technologies is not coded on Medicare bills. Since recalibration requires that the relevant cost or charge information be available on a DRG-basis, and since it may occur as infrequently as every four years, a substantial lag period could exist before the costs of some new technologies are reflected in DRG weights.

Inability of the Payment System To Identify Patients Who Use More Than Average Amounts of Resources.—PPS payments are calculated to reflect the average costs of care for a group of hospital discharges. Some technologies, however, are only applied to certain patients who might incur higher costs than the average case in the DRG. The ICD-9-CM and DRG classification systems are limited in their ability to identify these high cost patients. For example, patients who receive parenteral nutrition may be more expensive to treat than the typical patient in the same DRG. PPS payments may fall short of costs in such cases. Hospitals have the financial incentive to limit the use of these expensive technologies or not to try new technologies that will further increase costs. Thus even when current data are available, the payments for these discharges (based on average costs or charges) may be less than costs unless changes are also made in the DRG classification.

Countervailing Considerations

The information lags and other imperfections described above will always result in at least some desirable but costly new technologies being underpriced. This does not imply, however, that these technologies will be systematically excluded from hospitals or made inaccessible to Medicare beneficiaries. The following incentives may encourage hospitals to adopt at least some of these technologies, and in some cases, at a faster pace than in the past:

Profits Earned From DRG Prices.—PPS provides an opportunity for hospitals to earn profits when DRG prices exceed the hospital's costs. Uses of surplus revenues are varied—they may be used to develop new product lines, to replace obsolete facilities and equipment, to distribute earnings to shareholders (in the case of for-profit

hospitals), to finance care to uninsured patients, or to defray expenses associated with the adoption of costly new technologies.

Physicians.—While Medicare now pays for inpatient hospital services on a per case basis, physician payment remains on a per service basis. Physicians generally benefit when a hospital adopts a new technology because it affords opportunities to provide new services and receive payment on a fee-for-service basis. Physicians have always been a source of pressure on hospitals to adopt new technologies and they can be expected to continue this pressure, even in cases when technologies may be "unprofitable" to the hospital. In addition, opportunities exist for physicians, or physician groups, to purchase new technologies when hospitals are unable or unwilling to do so.

Non-Price Competition.—A by-product of a more competitive hospital industry is a growing emphasis on strategies for attracting patients. The hospital industry has always had "loss leaders" under cost reimbursement, and competition intensifies the need to build a reputation for providing a superior service. Humana's support of its artificial heart implantation program is perhaps an extreme example of what may become an industrywide phenomenon. Since hospitals are unable under PPS to compete for Medicare patients on the basis of price, adoption of costly new technologies is an alternative means of attracting patients away from competitors.

Potential Mechanisms for Altering the Financial Incentives To Develop and Adopt New Medical Technologies

The problems facing new technologies can be addressed on a case-by-case basis, or alternatively they can be dealt with generically. Listed below are several policy options within each of these general approaches. Some of these options exist already within PPS, while the remainder represent new policy alternatives.

Addressing Costly New Technologies on a Case-By-Case Basis

Costly new medical technologies could be addressed under PPS on a case-by-case basis. Under this approach, the "fix" may vary significantly from technology to technology, with the goal being to find the most appropriate payment mechanism for the specific technology. Examples of this approach are provided in the papers on extracorporeal shock wave lithotripsy and magnetic resonance imaging found elsewhere in Appendix B.

1. Options already existing within PPS:
   - *Reweighting or "pricing" of certain DRGs annually or more often.*
2. New policy alternatives:
   - *Temporary assignment of cases to DRGs or creation of temporary DRGs.* Special procedure codes may be required for these assignments.
   - *Creation of cost pass-throughs.* Once cases using a new technology are identified, a mechanism would be required to assess the costs of care and provide payments.
   - *Development of payment adjustments for hospitals that use a specific new technology.* Such adjustments would be paid only to those hospitals using the new technology.

Addressing Costly New Technologies Generically

Under these options, the problems facing costly new technologies are considered together.

1. Options already existing within PPS:
   - *Changes in outlier policy.* This could include changes in the payment levels or thresholds under current outlier policy or creation of new types of outliers (for example, technology outliers).
   - *Changes in the adjustments for teaching hospitals or referral centers.* The payment amounts and criteria for payment could be changed for teaching hospitals or referral centers.
   - *Recalibration of all DRGs annually.*
2. New policy alternatives:
   - *Development of payment adjustments for hospitals using new technologies.* Such adjustments would be paid only to those hospitals using new technologies.

Considerations When Evaluating the Policy Options

When evaluating each of the above policy options, the Commission considered the following questions:

- What is the magnitude of the problem being addressed and how certain is the estimate of that magnitude?
- What type of technology should be targeted? Should financial incentives be changed for only the most expensive technologies (i.e., the "big ticket" items) or all new cost-increasing technologies?
- At what point in the life cycle of a technology is it a candidate for an alternative payment mechanism? How long should a new technology be supported by a special payment mechanism?
- Who decides how to allocate resources among competing technologies?
- How difficult will the system be to administer for providers and/or intermediaries?
- Will the system have the desired effect of encouraging cost-effective technologies? Could it encourage the "overuse" of some technologies?
- How will the payment mechanisms affect providers' and manufacturers' incentives for efficiency?
- Should a goal of the mechanism be to provide needed information on the appropriate payment for and use of technologies?
- Will the payment mechanism affect beneficiary access to new technologies?
- What will be the source of funds for the adjustment? If it is "budget neutral," will it have an adverse impact on other providers or services?

Commission Actions

The Commission believes that HCFA should address new technologies on a case-by-case basis, using existing policy options whenever possible. Commission evaluations of two such new technologies, magnetic resonance imaging and extracoporeal shockwave lithotripsy, appear elsewhere in this section of the Technical Appendixes.

PPS PAYMENTS FOR EXPENSIVE PROSTHETIC AND IMPLANTABLE DEVICES AND OTHER MEDICAL SUPPLIES

In its 1984 Report on the Appropriateness of Hospital Payments for Pacemaker Implantation, ProPAC identified several important and unresolved issues concerning the equity of hospital payments and quality of patient care. Some of the data cited in the report suggested that the problems were due to the high cost of pacemaker units and the unique cost structure of hospital discharges involving their implantation. As similar issues arose in analyses of other expensive devices, the Commission decided to evaluate on a generic basis the issues concerning PPS payments for expensive prosthetic and implantable devices and other medical supplies (hereafter termed "expensive devices").[1]

Identification of Expensive Devices and Methods of Analysis

Using an operational definition of an expensive device as one that has a price of at least $300, ProPAC developed an extensive list of expensive devices from a previous Commission list, discussions with manufacturers and hospital purchasing agents, and detailed reviews of hospital supply manuals, hospital inventory lists and the 1985 Medical Device Register. Approximately 70 different devices associated with 104 ICD-9-CM procedure codes were identified and appear in Table B-1.

The 1984 PATBILL file was then searched for all discharges with the designated procedure codes. Although expensive device discharges were identified in 413 different DRGs, many of these DRGs had only one or a few discharges involving a device. The list was therefore reduced to the 36 DRGs with the greatest number of expensive devices; the cases in these DRGs reflected the vast majority of expensive device discharges. Table B-2 presents the 36 DRGs and the associated devices. Table B-3 presents summary PATBILL data on these same DRGs, including the number of expensive device cases, the percent of total cases involving expensive devices in each of the DRGs, and the ratio of supply costs to total costs for all discharges and for just the expensive device cases.

The majority of analyses was performed on 1984 PATBILL discharges in these 36 DRGs. For cases in each of the DRGs, 1986 payments were compared to 1986 estimated costs. Payments were calculated from the ProPAC PPS Payment Model. This model calculates a unique payment for each hospital based on the institution's hospital specific payment amount, its location (region and urban/rural), area wage index, and indirect teaching adjustment. Payments were estimated using varying proportions of federal and hospital specific payments. The final results of all analyses were independent of the proportions used in the payment equation.

Two alternative cost estimates were developed for each discharge. The first method involved multiplying the 1984 routine and special care days and ancillary charges by the appropriate 1981 Medicare Cost Report per diems and ratios of costs-to-charges, with the total then inflated to a 1986 rate. In the second method, the 1984 total covered charge was multiplied by .72 (the historical average cost-to-charge ratio) and then inflated to a 1986 level. The results in terms of direction and statistical significance were not sensitive to the selection of one or the other cost measure. Furthermore, the conclusions drawn in this paper are not generally dependent on the absolute values of the cost estimates, but rather the relative costs of one institution to another.

[1]The staff of the Project HOPE Center for Health Affairs, under ProPAC contract number T31416362, worked with the Commission staff on many of these analyses.

Table B-1.—Expensive Devices: Procedure Codes And Range Of List Prices

Device	Procedure Code(s)	Representative Range Of 1985 List Prices
Orthopedics		
Ankle:		
Total	81.48	$527-1,030
Talar	81.48	267-490
Tibial	81.48	260-540
Elbow:		
Total	81.84	800-1,760
Humeral	81.84	650-900
Ulnar	81.84	590-790
Radial	81.84	145-220
Hip:		
Total	81.51, 81.59	709-2,360
Stems	81.61, 81.62	400-1,770
Cup	81.63, 81.64	150-650
Endoprosthesis (Fem. Head)	81.61-64, 81.69	260-1,770
Resurfacing Shells	81.51, 81.59, 81.61-64	205-515
Rods:		
Femoral	78.55, 79.35	182-483
Humeral	78.52, 79.31	320
Shoulder:		
Total	81.81, 81.83	990-1,170
Glenoid (Scapular Cup)	81.81, 81.83	110-480
Humeral Prosthesis	81.81, 81.83	342-690
Thumb Prosthesis	81.71	280
Knee:		
Total	81.41	779-3,280
Femoral	81.41	360-1,560
Tibial	81.41	304-1,280
Patella	81.41	115-340
Plate:		
Condylar	79.35	195-595
Sacroilliac	79.39	475-525
Wrist:		
Joint	81.86, 81.87	304-580
Dorsal Column Stimulator	03.93	3,270-3,850
Mandibular Bone Plate	76.41	670-735
Cardiovascular		
Pacemakers:		
Single-Chamber, Programmable	37.70, 37.73-74, 37.76, 37.85, 99.79	2,795-4,500
Single-Chamber, Non-Programmable	37.70, 37.73-74, 37.76, 37.85	2,095-2,750
Dual-Chamber, Programmable	37.73-77, 99.79	3,950-6,000
Leads (Permanent)	37.81, 37.82	450-595
Cardiac Membrane Oxygenators + (Cardiotomy Reservoir)	39.61	300-434 + (83)
Annuloplasty Ring	35.33	350-375
Intra-Aortic Balloon Catheter (Percutaneous)	37.61	420-595
PTCA Catheter	36.0, 38.66	160-400
Xenograft Heart Valves:		
Aortic	35.21	1,195-2,100
Mitral/Tricuspid	35.23, 35.27	1,195-2,100
Pulmonic Conduct	35.25	2,375
Mechanical Heart Valves:		
Aortic	35.22	2,095-2,375
Mitral/Tricuspid	35.24, 35.28	2,095-2,125
Pulmonic Graft Valve	38.45, 35.26	2,375
Implantable Defibrillator	To Be Determined	14,500
Surgical Implants		2,875-4,375
Infusion Pump (Liver Cancer)	(54.11 or 54.12) + (38.91 or 86.09) +99.25	

Table B-1.—Expensive Devices: Procedure Codes And Range Of List Prices—Continued

Device	Procedure Code(s)	Representative Range Of 1985 List Prices
Vascular Grafts	38.40-38.49, 36.91	160-810
Cardiovascular Patch (PTFE)	35.51, 35.53, 39.57, 39.58	180-800
Portacath:		
Arterial	38.91	350-460
Peritoneal	54.93	460
Venous	38.93	402-460
Penile Prosthesis:		
Inflatable	64.95	1,980-3,000
Malleable	64.95	530-1,120
Mammary Prosthesis (Inflatable)	85.54, 85.7, 85.93	148/295 (pair)-209/418 (pair)
Pectoralis Muscle	83.87, 85.7	545
Tissue Expander	85.53, 85.54, 85.7, 85.93	300-440
Peritoneovascular Shunt	54.94	375-425
Vaginal Stent	70.62	245-540
Arteriovenous Shunt	39.29, 39.93, 39.94	295-2,800
Urinary Incontinence Device (Mechanical, Hydraulic)	57.99	530-2,790
Vena Cava Filter	38.7	325-570
Phrenic Nerve Stimulator	34.85	7,420-16,905
Hakin Valve Unit	02.2, 02.31-02.39, 02.42	290-385
ENT & Ophthalmics		
Ear Implants:		
Membrane	19.52-.55, 19.6	450-650
Ossicular (Used In Multiples)	19.11, 19.21, 19.29, 19.3, 19.53	90/part-155/part
Facial Implants	76.92	74-3,000
Blocks/Sheets (Used In Multiples)	76.92, 86.60	50-450
Lens, Implant Intraocular (Anterior, Posterior Chambers)	13.70-.72	100-500

SOURCE: Information collected by Project HOPE Center for Health Affairs (ProPAC Contract Number T-3146362).

Table B-2.—Expensive Device DRGs, The Associated Devices, And The ICD-9-CM Codes

DRG	Description	Associated Device(s)	Relevant ICD-9 Codes
1	Craniotomy Age >17 Except For Trauma	Hakin Valve Unit	2.2,2.31-5,2.39,2.42
4	Spinal Procedures	Dorsal Column Stimulator	3.93
39	Lens Procedure	Intraocular Lens	13.70-2
53	Sinus + Mastoid Procedures Age >17	Membranes, Ossicular, Cochlear, Facial Implants & Block/Sheets	19.11,19.29,19.3,19.52-5,19.6,20.41,76.92
55	Miscellaneous Ear Nose + Throat Procedures	Membranes and Ossicular Implants	19.11,19.21,19.29,19.3,19.52-5,19.6
76	O.R. Proc On The Resp System Exc. Maj. Chest W/CC	Vena Cava Filter, Arterial and Venous Portacaths	38.7,38.91,38.93,39.29,39.61,39.93
77	O.R. Proc On The Resp System Exc. Maj. Chest W/O CC	Vena Cava Filters, Arterial and Venous Portacaths	38.7,38.91,38.93,39.29,39.61
104	Cardiac Valve Proc. W/Pump + W/Cardiac Cath	Heart Valves, IABP, Vascular Grafts, PFTE, Annuploplasty Ring	35.21-7
105	Cardiac Valve Proc. W/Pump + W/O Cardiac Cath	Heart Valves, IABP, Vascular Grafts, PFTE, Annuloplasty Ring	35.21-7
106	Coronary Bypass W/Cardiac Cath	Cardiac Membrane Oxygenators, PTCA Catheter, Vascular Grafts	36.0,36.91,38.44,39.61
107	Coronary Bypass W/O Cardiac Cath	Card. Membrane Oxygenators, IABP, PTCA Cath., Vascular Grafts	36.0,36.91,38.44,39.61
108	Cardiothor Proc Exc Valve + Coronary Bypass W/Pump	Card. Membrane Oxygenator, Vascular Grafts, PTCA Catheter	35.33,35.51,35.53,36.0,36.91,37.61,38.44-5,38.7, 39.57-8,39.61
109	Cardiothoracic Proc W/O Pump	Intra-Aortic Balloon, Grafts	35.33,35.51,35.53,36.0,37.61,38.44-5,38.7,39.57-8
110	Maj. Reconstructive Vascular Procs. Age >69 And/Or CC	Vascular Shunt (A-V), Vascular Grafts	38.4,38.42-4,38.46-9,38.7,38.91,38.93,39.29,39.57-8, 39.93-4,54.93-4
111	Maj. Reconstructive Vascular Procs Age <70 W/O CC	Vascular Shunt (A-V), Vascular Grafts	38.4,38.42-4,38.46-9,38.7,38.91,38.93,39.29,39.57-8, 39.93-4,54.93-4
112	Vascular Procs Exc. Maj. Reconstruction	PTCA Catheter, Vascular Grafts, A-V Shunts	2.33,36.0,38.3-4,38.46-9,38.7,38.91,38.93,39.57-8, 39.93-4
115	Permanent Cardiac Pacemaker Implant W/AMI Or CHF	Pacemakers and Leads	37.7,37.73-4,37.76-7,37.81-2,99.79
116	Permanent Cardiac Pacemaker Implant W/O AMI Or CHF	Pacemakers and Leads	37.7,37.73-4,37.76-7,37.81-2,99.79
117	Cardiac Pacemaker Replace + Revis Exc. Pulse Gen Repl Only	Pacemaker Leads	37.81-2,37.85,99.79
118	Cardiac Pacemaker Pulse Generator Replacement Only	Pacemakers	37.85,99.79
191	Maj. Pancreas Liver + Shunt Procs	Peritoneovascular Shunt	38.91,38.93,39.29,39.57,39.93-4,54.94
209	Major Joint Procedures	Total: Knee, Ankle, Hip, Hand & Finger, Shoulder, Elbow, & Wrist	81.41,81.48,81.51,81.59,81.71,81.81,81.84,81.87
210	Hip + Femur Procs Exc. Maj. Joint >69 And/Or CC	Femoral Rod & Plate, Femoral Head	78.55,79.35,81.69
211	Hip + Femur Procs Exc. Maj. Joint 18-69 W/O CC	Femoral Rod, Femoral Head	78.55,79.35,81.69
214	Back + Neck Procs >69 And/Or CC	Dorsal Column Stimulator	3.93
218	Lower Extrem + Humer Proc Exc. Hip Foot Femur >69 And/Or CC	Humeral Rod, Shoulder: Total, Scapular Cup, & Humeral Prosthesis	78.52,79.31,79.39,81.81,81.83-4

Table B-2.—Expensive Device DRGs, The Associated Devices, And The ICD-9-CM Codes—Continued

DRG	Description	Associated Device(s)	Relevant ICD-9 Codes
219	Lower Extrem + Humer Proc Exc. Hip Foot Femur 18-69 W/O CC	Humeral Rod, Shoulder: Total, Scapular Cup & Humeral Prosthesis	78.52,79.31,79.39,81.81,81.83-4
223	Upper Extremity Proc Exc. Humerus + Hand >69 And/Or CC	Total Shoulder, Elbow: Total And Components, Wrist	81.81,81.83-4,81.87,83.87
224	Upper Extremity Proc Exc. Humerus + Hand <70 W/O CC	Total Shoulder, Elbow: Total And Components, Wrist	81.81,81.83-4,81.87,83.87
308	Minor Bladder Procs >69 And/Or CC	Electronic Bladder Stimulator, Urinary Incontinence Device	57.99,64.95
315	Other Kidney + Urinary Tract O.R. Procs	Arteriovenous, Perlteneovenous Shunts & Catheters	38.91,38.93,39.29,39.93-4,54.93-4
341	Penis Procedures	Penis Prosthesis	64.95
403	Lymphoma Or Leukemia >69 And/Or CC	Portacaths: Arterial And Venous	38.91,38.93
404	Lymphoma Or Leukemia 18-69 W/O CC	Portacaths: Arterial and Venous	38.91,38.93
410	Chemotherapy	Portacaths: Arterial and Venous	38.91,38.93
471	Bilateral Or Multiple Joint Proc Of Lower Extremities	Total: Knee, Ankle, Hip; Acetabulum, Endoprosthesis	81.41,81.48,81.51,81.59,81.61-4

SOURCE: Information collected by Project Hope Center for Health Affairs (ProPAC Contract Number T-3146362).

Table B-3.—Expensive Device DRGs: Number Of Cases And Supply Costs

DRG	Expensive Device Cases		Supply Costs As Percent Of Total Costs	
	Number	Percent of Total Cases	EDS Only	All Discharges
1	4,367	22.9	9.4	8.4
4	120	3.3	19.9	7.3
39	286,538	75.2	22.9	21.7
53	628	7.2	8.5	7.6
55	2,024	13.5	9.1	8.1
76	457	4.9	8.9	6.6
77	167	3.9	10.0	6.6
104	2,768	96.0	16.6	16.5
105	9,459	95.9	17.0	17.0
106	8,650	49.2	12.9	12.9
107	22,668	58.9	13.5	13.2
108	842	100.0	13.6	13.6
109	1,743	41.7	14.6	13.3
110	38,739	78.6	12.1	12.1
111	6,947	73.4	11.5	11.6
112	14,476	35.7	11.5	10.9
115	7,173	100.0	28.4	28.4
116	47,987	100.0	37.5	37.5
117	2,367	50.1	30.0	24.8
118	7,665	100.0	43.2	43.2
191	638	17.8	10.6	9.6
209	87,014	65.5	22.1	18.8
210	93,461	86.9	11.9	11.8
211	6,403	80.9	11.5	11.5
214	85	0.3	26.8	7.1
218	4,670	30.8	9.4	9.9
219	1,088	15.2	9.7	10.4
223	2,270	21.8	14.7	11.0
224	1,452	25.6	14.9	11.6
308	220	1.6	13.1	9.6
315	4,716	34.3	10.2	10.0
341	3,563	32.8	26.3	16.1
403	1,351	2.7	7.5	5.7
404	266	2.9	8.3	4.7
410	1,392	2.0	10.9	5.7
471	1,487	100.0	20.4	20.4

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files. Analysis by Project HOPE Center for Health Affairs (ProPAC Contract Number T-31416362).

After identifying the expensive cases and their associated costs and charges, ProPAC then examined four related issues concerning the use of and payment for expensive prosthetic and implantable devices and other medical supplies.

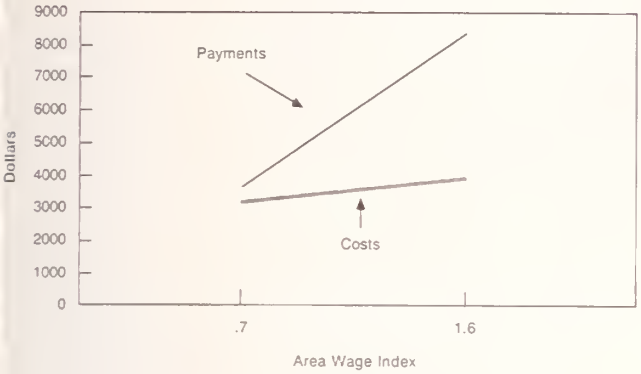
The issues are:

- Does an atypical cost structure in expensive device cases lead to inappropriate payments for some hospitals?
- Do methods of calculating DRG weights underestimate the cost of expensive devices?
- Do total costs per discharge for some devices exceed total PPS payment by a significant amount?
- Do substantial cost differences among the various models of a device influence the choice of a device for implantation?

Atypical Cost Structure

PPS adjusts individual hospital payments to reflect differences in certain costs over which the institutions may not have control. These adjustments, based on averages across all discharges and hospitals, are for hospital location (urban/rural and region of the country), local wage rate, indirect medical education and outlier cases. Discharges involving expensive devices, however, are atypical. They have a higher percentage of costs

Figure B-1.—The Relationship Between Area Wage Index And Hospital Costs And Payments For Discharges In DRG 118 (Pacemaker Replacement)



that are unrelated to the local wage rate because the devices are sold in a national market. Since the PPS wage adjustment applies equally to all cases in all DRGs based on average labor-related costs of about 80 percent, payments in the device DRGs may be inappropriate. Some hospitals may be overpaid while other institutions are underpaid.

ProPAC Analysis

Using multiple regression analysis, ProPAC calculated the individual effects of the area wage rate, the indirect teaching adjustment and hospital location (urban/rural) on hospital gains and losses (i.e., payments minus costs) and on the ratio of payments to costs. The findings were as follows:

- Area Wage Index.
  DRGs In Which The Majority of Cases Involve Expensive Devices. Hospitals in high wage rate areas receive a significantly[2] higher payment, relative to costs, for the DRGs with a high proportion of cases involving expensive devices and with a high ratio (i.e., generally greater than 20 percent) of supply costs to total costs. That is, for DRGs 39, 105, 115, 116 and 118, merely being located in a city with a high area wage index results in a significantly higher gain (i.e., payments minus costs). A similar effect was present for DRG 471 but the result was not statistically significant because of the small number of cases in the DRG. Figure B-1 presents data for DRG 118, but illustrates a relationship that exists for all these DRGs. Although costs are somewhat higher in locations with higher wage rates, payments are substantially greater in those same areas.[3] The magnitude of this effect is also demonstrated in Table B-4. The values in the table reflect the *additional* gain associated with being in a city with an area wage index .5 units greater than for another hospital.[4]

  DRGs That Combine Expensive Device Cases With Other Discharges. In a number of DRGs, discharges involving expensive devices are combined with many not involving expensive devices. Although none of these DRGs, when examined in total, demonstrated the effect of the area wage index described above, eight showed a significant effect for just the expensive device cases. (See Table B-5 for a complete list.) Thus, for these DRGs, hospitals in high wage areas have higher gains for the expensive device cases, but this payment distortion "averages out" over all the cases in those DRGs.
- Indirect Teaching Adjustment.
  In a majority of the DRGs examined, teaching hospitals had significantly higher gains than non-teaching hospitals, irrespective of the proportion of discharges involving a device.
- Urban and Rural Location.
  There was no consistent relationship between location (urban vs. rural) and hospital gains for expensive device cases. In some expensive device DRGs, urban hospitals had higher payments relative to costs while in other DRGs, the opposite relationship was true.

[2]For these analyses, the term significant implied both a statistical significance at the $p < .05$ level and an additional gain of at least 10 percent of average cost associated with a .5 difference in area wage index.

[3]Although Figure B-1 shows average payments greater than average costs for all wage index values, this relationship is not necessary to demonstrate a significant area wage index effect. The critical factor is significantly different slopes for the cost and payment lines.

[4]ProPAC also recommends reclassification of device cases in DRG 117. See Recommendation 26.

Table B-4.—Additional Gain Associated With A 0.5 Higher Value For The Area Wage Index

DRG	Brief Description	Additional Gain (Payments Minus Costs)
39	Lens Procedures	$ 303
105	Cardiac Valve Procedure W/Out Cath	4,192
115	Pacemaker With AMI Or CHF	2,511
116	Pacemaker W/Out AMI Or CHF	2,170
118	Pacemaker Replacement	2,086

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files. Analysis by Project HOPE Center for Health Affairs (ProPAC Contract Number T-31416362).

Conclusions

- In DRGs 39, 105, 115, 116 and 118, the PPS payment adjustment for the area wage index results in inappropriate gains for hospitals in cities with high wage rates and inappropriate reduction in payments for hospitals in low wage rate areas. This policy provides some hospitals with undesirable financial incentives to change the services they offer. One simple solution to the problem would be to modify the labor portion of the standardized amounts. Currently set at approximately 80 percent, the labor portion could be reduced in these DRGs. The correct percentage value could be estimated from wage data currently being generated by HCFA or from ProPAC data on supply costs.
- Adjustments should also be considered for DRGs 471, 209, and 104. The area wage index effect is likely to be significant in the future for DRG 471 when more cases are classified into this DRG. DRG 209 is similar to DRG 471 and very nearly demonstrates a significant area wage index effect. Cases in DRG 104 undergo cardiac catherization but in all other regards are identical to those in DRG 105. Adjusting DRG 105 without also adjusting DRG 104 could lead to payments in some hospitals that are lower for cases that undergo cardiac catherization.
- For the expensive device discharges in DRGs 110, 111, 112, 191, 210, 315 and 341, the PPS payment adjustment for the area wage index results in inappropriate gains for hospitals in cities with high wage rates.[5] This effect is masked, however, when all cases in the DRGs are examined. To the extent that hospitals can and will change their behavior in the future for cases in which an expensive device is used, these DRGs should be examined for possible reclassification.
- Expensive device discharges in which supply costs account for approximately 20 percent or more of total costs are most likely to demonstrate a significant area wage index effect. Any new device that meets this criterion should generally be classified into a unique DRG or one with cases involving similar device costs.
- Teaching hospitals have significantly higher operating margins than non-teaching hospitals, irrespective of the proportion of discharges involving a device. This finding is not unique to expensive device discharges, however, and reflects current payment adjustments for teaching hospitals.

Table B-5.—DRGs In Which Only The Expensive Device Cases Exhibit A Significant Area Wage Index Effect[a]

DRG	Brief Description
110	Maj. Reconstr. Vascular Proc., Age >69, W/C.C.
111	Maj. Reconstr. Vascular Proc., Age <70, W/Out C.C.
112	Vasc. Proc. Except Major Reconstruction
191	Major Pancreas, Liver And Shunt Procedures
209[b]	Major Joint Procedures
210	Hip And Femur Procedures
315	Other Kidney And Urinary Tract Proc.
341	Penis Procedures

[a]DRGs 39, 105, 115, 116 and 118 also demonstrate significant area wage index effects and are displayed in table B-MS-6.

[b]Almost all cases in DRG 209 involve devices, although some are significantly more expensive than others. The area wage index effect holds for just the most expensive devices.

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files. Analysis by Project HOPE Center for Health Affairs (ProPAC Contract Number T-31416362).

[5]ProPAC also recommends that the device cases in DRG 341 be classified into a unique DRG and that the labor portion of the standardized amounts be modified for this new DRG. See Recommendation 28.

The Methodology for Calculating the Cost of an Expensive Device

Concern has been raised whether the methods used for calculating the DRG weights could underestimate the cost of expensive devices. This potential inaccuracy would result from a difference in the mark up above acquisition costs for expensive devices when compared to the mark up for supplies with low acquisition costs. The result would be that payments for DRGs involving expensive devices are too low relative to other DRGs.

ProPAC Analysis

There is little empirical evidence in the literature supporting the theory that expensive devices receive a smaller mark up than other supplies and services, although at least one unpublished study on pacemakers suggests this is the case. Mark up policies in individual hospitals are also influenced by the payor mix associated with the utilization of specific supplies and services.

Study of this issue is very difficult due to the following:

- The extent to which the costs of expensive devices are underestimated would depend on the mark up of other supplies or services within the same cost center. To determine the typical mix of products in these cost centers and the associated mark ups would require a considerable research effort in itself.
- The lower mark up for expensive devices may reflect lower overhead costs (for example, purchase, storage, and handling) when these same overhead costs for inexpensive items are compared on a percentage basis.
- The detailed data to study this issue are not available. Hospital charges, acquisition costs, and overhead costs for individual supply items are not listed in PATBILL, Medicare cost reports, or other readily available data bases.

Conclusions

There is limited empirical evidence to support the theory that expensive devices receive a smaller mark up than non-expensive supplies and services. It would not be practical to study this issue by itself given the amount of effort and resources required to adequately investigate and solve the problem. This issue would best be examined in the context of a broader, long-term study into improving the data used for recalibration and recalculation of the standardized amounts.

Excess Costs per Discharge Over Total PPS Payment

In those DRGs that have a minority of cases involving expensive devices, the use of an expensive device may lead to costs for those cases that exceed payments.

ProPAC Analysis

In 18 of the DRGs in which not all cases receive an expensive device, there is a statistically significant negative relationship between the percent of cases involving a device in a hospital and its operating margin. That is, in the DRGs listed in Table B-6, the more device cases that a hospital has, the lower its gain or higher its loss. Only in DRG 111 (Major Reconstructive Vascular Procedure, Age < 70, w/out C.C.) do the device cases

Table B-6.—DRGs In Which Use Of An Expensive Device Leads To A Reduction In Operating Margins

DRG	Brief Description
53	Sinus And Mastoid Procedures, Age >17
55	Miscellaneous Ear, Nose And Throat Proc.
76	O.R. Procedures On Respir. System W/C.C.
77	O.R. Procedures On Respir. System W/Out C.C.
107	Coronary Bypass W/Out Cath.
109	Cardio Thorac Procedures W/Pump
110	Maj. Reconstr. Vascular Proc., Age >69 W/C.C.
112	Vasc. Proc. Except Major Reconstruction
117	Pacemaker Revision
209[a]	Major Joint Procedures
211	Hip and Femur Procedures
223	Upper Extrem Proc., Age >69, W/C.C.
224	Upper Extrem Proc., Age <70, W/Out C.C.
315	Other Kidney And Urinary Tract Proc.
341	Penis Procedures
403	Lymphoma Or Leukemia, Age >69, W/C.C.
404	Lymphoma Or Leukemia, Age <70, W/Out C.C.
410	Chemotherapy

[a]Almost all cases in DRG 209 involve devices, although some are significantly more expensive than others. Use of the more expensive devices in this DRG leads to lower operating margins.

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files. Analysis by Project HOPE Center for Health Affairs (ProPAC Contract Number T-31416362).

involve lower average costs than the non-device cases.

There are three likely explanations for device cases being more costly than the average discharge. They are all related to the fact that device cases are not really similar to the non-device cases in the same DRG. First, when the DRGs were developed, much importance was placed on the "clinical coherence" of patient groupings. It appears that in many cases, however, the clinical coherence means procedures performed in the same anatomical region. Thus, in a DRG for upper extremity procedures, one finds implantation of arm prosthesis combined with an open repair of the radius. The two procedures are not really similar.

The second explanation for the finding that device cases are more costly than average is related to the original method used for examining resource use in a DRG. The developers of the classification system first tested the homogeneity of cases in a DRG by examining data on length-of-stay. Even though a discharge involving a prosthesis, for example, might have a length-of-stay similar to a case without a prosthesis, the cost of the prosthesis would make the former case significantly more expensive.

Finally, in some of these DRGs, the expensive device might only be used in the most severely ill patients. In other words, our finding that use of a device leads to higher costs and lower operating margins may reflect the general insensitivity of DRGs to severity-of-illness.

Conclusions

In many expensive device DRGs, the device cases are relatively more resource intensive than the non-device cases. This relationship is due in most discharges to the expense of the device. It has already been suggested (under Issue 1 above) that such device cases be classified separately from non-device cases. In some of these DRGs, however, the greater resource consumption in device cases is more likely due to the characteristics of the patient (for example, the severity of illness) or the patterns of medical practice in the hospital (for example, use of a specific technology). This area should be further explored in the context of more general studies into heterogeneity.

Substantial Cost Differences Among the Various Models of a Device Influence the Choice of a Device for Implantation

When purchasing an expensive medical device for implantation into a patient, a hospital may have several different types and models from which to choose, often with significant differences in cost. The magnitude of these cost differences between models is shown in Table B-1. Thus, in a DRG involving such expensive devices, there are likely to be two or more subgroups of cases with significantly different costs (hereafter termed the "multiple models problem"). Since the hospital receives the same payment regardless of the model chosen, there is a financial incentive for the institution to implant the least expensive model. Moreover, it is currently illegal for a beneficiary to pay the additional cost for a more expensive model. As a result, Medicare beneficiaries could potentially be limited in their access to the more expensive models.

ProPAC Analysis

Two of the major classification objectives underlying the development of the DRGs were: 1) clinical meaningfulness or coherence, and 2) homogeneity of resource use. The existence of multiple models of the same device raises a conflict between these two objectives. If two alternative models of a device perform similar functions and the patients who receive the devices are similar, then discharges involving the alternative models should be grouped together on grounds of clinical coherence. On the other hand, if they differ greatly in costs, then resource use will no longer be homogenous.

It is important to understand that this multiple models problem is in fact a subset of the general problem of heterogeneity. Although the existence of alternative models may highlight the perception of a heterogeneity problem (due to the highly visible device costs and the potential substitutability between models), the problem remains one of a DRG with subgroups of cases that have dissimilar costs. Furthermore, as in many heterogeneity problems, there is often disagreement concerning the use of alternative therapies (or device models).

Acknowledgment of the generic nature of this problem leads to a discussion of the factors that one might wish to consider in any decision to reclassify DRGs or make special payment adjustments.[6]

Clinical Coherence.—One of the original goals in the development of DRGs was to create clinically coherent or meaningful groups of cases based on the clinical characteristics of the patient, not the therapeutic modalities provided by the hospital. Although all the current *medical* DRGs are constructed in this fashion, the *surgical* DRGs are defined by the procedures performed on the patients. One of the most important decisions regarding reclassification is whether changes in patient groupings should be based on patient characteristics, on therapies provided by the hospital, or some combination of the two.

If additional classification based on procedures is desirable, a further question arises for DRGs involving medical devices. Are discharges with different models of the same device similar enough for inclusion in the same DRG? To reach such a subjective decision, one can compare device DRGs with others in the classification system. Unfortunately, in making such a comparison, one quickly finds that the DRG system is rather inconsistent with regard to clinical coherence. There are DRGs that include cases with only one type of surgery or one single principal diagnosis, while other DRGs include cases with distinctly different procedures or different principal diagnoses.

The Definition of Device Groups.—Any decision to reclassify a DRG or to make payment adjustments based on model or type of a device would require a clear definition of the device group or groups. Ambiguities in the definition of groups could lead to distortions in payment and possible gaming.

The Ability of ICD-9-CM To Identify Models of Devices and the Clinical Criteria for Implantation.—ICD-9-CM does not currently distinguish between models or types of most expensive devices, although such codes can easily be developed in most cases. A more important coding problem, however, may be the ability of ICD-9-CM to identify the clinical criteria for implantation. If the indications for a device can be described as a condition (for example, a diagnosis, sign, or symptom), then ICD-9-CM diagnosis codes can likely be used to identify cases for reclassification. If, however, ICD-9-CM cannot accurately reflect the criteria, then reclassification must instead be based on procedure codes for implanting the device. This is less desirable as it may encourage implantation of the more expensive devices in patients who lack appropriate medical indications. Although review of appropriate criteria could be assigned to the PROs, the Commission would have to determine the feasibility and desirability of such a process.

Heterogeneity of Costs.—The greater the heterogeneity of costs in an individual DRG, the greater is the opportunity for financial gain or loss. Thus the Commission may wish to recommend reclassification or payment adjustment for different models of a device if a DRG is relatively heterogenous.

Since heterogeneity is a subjective term, it is important to compare the heterogeneity of device DRGs with non-device DRGs. In addition to statistics such as the coefficient of variation and the R^2 value in analysis of variance, the following can be considered:

- There are approximately 120 "DRG pairs" in the system that differ only in the presence or absence of complications and comorbidities or in patient age. On average, payments in the paired DRGs differ by about $848, or an average of 28.5 percent of the average standardized urban payments (i.e., exclusive of adjustments for area wage index, indirect teaching and outliers).
- HCFA recently created DRG 471 for cases with multiple joint procedures of the lower extremity. Cases in DRG 471 have average charges that are about $6,000 greater than cases in DRG 209 (the DRG where the cases were formerly classified), a difference of about 62 percent.

Total Costs to Medicare.—By currently grouping together in the same DRG cases involving different models of a device, PPS provides a fi-

[6] Although the DRG system has potential uses in a number of different areas (for example, hospital payment, physician payment, case-mix management, cost management, etc.), for the following discussion we will consider only the use of DRGs for payment under Medicare's PPS.

nancial incentive for hospitals to use the least costly model. Thus, any recommendation to reclassify cases or adjust payments for type of device is likely to encourage the use of more expensive models. Such a change in practice could lead to immediate increases in total Medicare payments for the device cases.[7] Any reclassification decision should therefore weigh this increased cost with the likely benefits of the change.

Quality of Patient Care and the Likely Benefits of Reclassification.—As described above, any reclassification or payment adjustment based on model of device is likely to increase the use of more expensive models. If these more expensive models provide a higher quality of care, then it is important to understand the magnitude of this increased quality.

Number or Distribution of Medicare Cases Involved.—The greater the number of cases in a DRG with costs different from the average, the more important a decision to reclassify or to adjust payments.

Number or Distribution of Hospitals Affected.—If all hospitals have a similar distribution of device cases (i.e., similar rates of implanting more expensive models) and do not alter their practice patterns, then reclassification or payment adjustment is not necessary. DRG payments based on average charges or costs should be appropriate. If, however, some hospitals limit or cease to provide services for specific subgroups of patients, and if this change proves undesirable, then reclassification or payment adjustment may be desirable.

Conclusions

The DRG system currently groups together into the same DRG all cases involving different models of the same expensive device. Thus, in some of these DRGs, there are likely to be two or more subgroups of cases with significantly different costs—the multiple models problem. A decision to reclassify such discharges or to adjust payments to reflect the model of device used could have significant effects on both costs and quality of care. When evaluating a heterogeneity problem such as this, the following factors should be considered:

- Clinical coherence
- Definition of device group(s)
- ICD-9-CM coding
- Heterogeneity of costs
- Total costs to Medicare
- Quality of care
- Number or distribution of Medicare cases
- Number or distribution of hospitals

Recommendation

The labor portion and nonlabor portions of the standardized amounts should be redefined for DRGs 39, 104, 105, 209, 471, and the newly defined DRGs for pacemaker implantation and replacement (Recommendations 25 and 26), implantable defibrillators (Recommendation 27), and penile prostheses (Recommendation 28). The new portions should more closely reflect the labor related and nonlabor related shares of costs for cases in each of these DRGs. These recalculations should be made so that total hospital payments remain unchanged. The correct labor portion and non-labor portion of the standardized amounts should be calculated from data currently being generated in the Health Care Financing Administration's study of the labor portion of costs by DRG. If this information proves to be incomplete, the portions should be calculated from available cost and charge data for these DRGs. The Secretary should study the need for adjustments to the labor portion and non-labor portion of the standardized amounts in all DRGs.

[7]Some costly devices might reduce total Medicare payments in the long run if they lead to decreases in rehospitalization or outpatient treatments.

CARDIAC PACEMAKERS

The Multiple Models Problem

ProPAC's March 1985 "A Report on the Appropriateness of Medicare Hospital Payments for Pacemaker Implantation" identified significant differences in the costs of different types of pacemakers. A hospital, however, receives the same DRG payment regardless of the type or model of pacemaker implanted. This provides the hospital with a financial incentive to implant the least costly device, and perhaps limit beneficiary access to more expensive models.

This "multiple models problem" is not unique to pacemakers and affects many different expensive devices. The problem is one of DRG heterogeneity, raising the issue in this example of whether pacemaker DRGs should be reclassified or payments adjusted to reflect differences in the model or type of pacemaker implanted.

Definition of Device Groups

Any decision to reclassify pacemaker DRGs on the basis of pacemaker type would require clear definitions of the categories of pacemakers. In general there are two criteria for which subgroups could *currently* be defined:

- *Number of chambers*. Dual-chamber pacemakers can easily be distinguished from single-chamber models in that the former group uses two electrical leads, one connected to the atrium and one connected to the ventricle. Single-chamber pacemakers use only one lead.
- *Programmability*. Pacemakers are generally described as either non-programmable, simple-programmable, or multi-programmable. Distinguishing between multi-programmable and simple-programmable models could be problematic if payment were based on this characteristic.

Although other characteristics can be used to distinguish between models of pacemakers, and more are likely to develop in the future, the two described above are currently the most generally accepted. Since the dual/single distinction is the most important financially (i.e., there are significant differences in number of implants and cost of units between dual- and single-chamber models), and since any reclassification based on programmability could lead to ambiguities, the remainder of this analysis will evaluate the implications of a reclassification or payment adjustment based on whether a dual- or single-chamber model is implanted.

Clinical Coherence

There are two "clinical coherence" questions that must be considered with regard to pacemakers. First, should clinical coherence in this surgical DRG be evaluated in terms of patient characteristics, surgical procedures, or both? Second, is this DRG clinically coherent?

If reclassification is to be based on patient characteristics, then the patients who receive dual-chamber pacemakers must be different than those with single-chamber models. The following statements, from an Office of Health Technology Assessment report, concern the medical indications for dual-chamber pacemakers:[8]

> Expert physicians differ in their judgments about what constitutes appropriate criteria for dual-chamber pacemaker use . . . For the following conditions, dual-chamber cardiac pacemakers may be acceptable or necessary in the judgment of most knowledgeable physicians . . .
> - Patients in whom single chamber pacing at the time of pacemaker insertion elicit a definite drop in blood pressure, retrograde conduction, or discomfort.
> - Patients in whom the pacemaker syndrome, with significant symptoms, has already been experienced with a pacemaker that is being replaced.
> - Patients in whom even a relatively small increase in cardiac efficiency will importantly improve the quality of life (for example, patients with congestive heart failure).
> - Patients in whom the pacemaker syndrome can be anticipated—e.g., in young and active people.
> - Second or third degree heart block.

[8]Peter L. Frommer, M.D., Deputy Director, National Heart, Lung, and Blood Institute, in an Office of Health Technology Assessment (OHTA) report on pacemakers, 1984.

A number of other medical conditions could also, in the judgment of some physicians, require dual-chamber pacemakers.

Alternatively, the clinical coherence of the pacemaker DRGs might be evaluated in terms of surgical procedures. The surgical techniques used in pacemaker implantation are generally the same regardless of model or type of device. Dual-chamber pacemakers, however, require that two pacemaker leads be implanted. In addition, more sophisticated pacemakers can require more testing at the time of implantation.

ICD-9-CM Coding

Current ICD-9-CM codes provide only limited ability to distinguish between dual-chamber and single-chamber implants. Improvements in the pacemaker codes have been proposed to the ICD-9-CM Coordination and Maintenance Committee.

Current ICD-9-CM codes can identify some of the clinical criteria for implanting dual-chamber pacers, including CHF and heart block. A unique code has been proposed for the pacemaker syndrome. It is unlikely, however, that ICD-9-CM could be used to uniquely identify cases meeting the other accepted criteria.

Heterogeneity of Costs

Using the coefficient of variation of charges from the 1984 PATBILL file as a measure of heterogeneity, the pacemaker DRGs appear relatively homogeneous.

	DRG 115	*DRG 116*	*DRG 117*	*DRG 118*	*Average Surgical DRG*
Coefficient of Variation of Charges (in percent)	50	40	82	46	67

In each of these DRGs, however, there are significant differences in costs between cases involving dual-chamber models and those with single-chamber devices. Although we are unable to distinguish these differences accurately on the 1984 PATBILL file, ProPAC's pacemaker report last year highlighted the following differences in device and lead costs:

	1984 Costs
Dual-chamber model + 2 pacemaker leads	$6,271
Single-chamber model + 1 pacemaker lead	4,535
Difference	$1,736

This difference of $1,736 is equal to approximately 30 percent of the standard payment (exclusive of adjustments) in DRG 118 and a lower percentage in the other pacemaker DRGs.

Total Costs to Medicare

If dual-chamber or functionally similar pacemakers totally replace single-chamber models, Medicare payments may increase substantially over a number of years. The total could be as high as $85 million.[9]

Quality of Patient Care and the Likely Benefits of Reclassification

A reclassification or adjustment of payments based on model of pacemaker could affect quality of care if the following two conditions are both met: 1) patients who would benefit from dual-chamber models are not currently receiving them, and 2) those same patients would get dual-chamber pacers after any change in classification or payment. ProPAC does not have data on the number of Medicare beneficiaries that meet the criteria for dual-chamber pacemakers or the type of pacemaker that those patients are currently receiving.

Number or Distribution of Medicare Cases and Hospitals

There were approximately 65,000 pacemaker implants in Medicare beneficiaries in fiscal year 1984. We estimate that approximately 26 percent of these cases involved dual-chamber models, but we have no reliable data on how these cases were distributed across hospitals.

[9]Dual-chamber pacemakers will never completely replace single-chamber models because the former type is contraindicated in some patients. Nevertheless, since some cardiologists have advocated that nearly all patients should get dual-chamber models, we cite the $85 million figure as an upper estimate of the potential increase in Medicare costs. This figure is calculated using the following data:

- approximately 65,000 pacemaker implants in 1984 PATBILL;
- average cost of a dual-chamber pacer and 2 leads: $6,271;
- average cost of a single-chamber model and 1 lead: $4,535;
- 26 percent dual-chamber and 74 percent single-chamber implants in 1984.

Conclusions Concerning Multiple Pacemaker Models

Dual-chamber pacemakers are distinct electronically and physiologically from single-chamber models. The implantation of a dual-chamber pacemaker is clinically similar to the implantation of a single-chamber device, although the former procedure requires insertion of two pacemaker leads. Expert physicians differ in their judgments about what constitute appropriate criteria for dual-chamber pacemaker use. ICD-9-CM codes cannot be used to identify all the recognized criteria for implantation. In 1984 dual-chamber pacemakers and their required leads cost about $1,736 more than single-chamber models, reflecting about 30 percent of the standard payment in DRG 118. If all pacemaker implants involved dual-chamber models, total Medicare costs might increase significantly.

Cases Involving Pacemaker Replacement

The current DRG classification of cases involving pacemaker *replacement* is inconsistent and confusing. A case with pulse generator replacement only (i.e., no change in pacemaker leads) is generally classified into DRG 118, while a replacement that also involves a lead change is generally classified into DRG 117. Either kind of replacement, however, can be grouped into the higher paying DRG 116 if certain ICD-9-CM procedure codes are used by the hospital. Finally, any pacemaker case (initial implant or replacement) in a patient with congestive heart failure, myocardial infarction, or shock is classified into DRG 115.

In Table B-7 are 1984 PATBILL data on replacement and non-replacement cases in each of the DRGs. The cases identified as "replacement" in DRGs 115, 116 and 118 had one or more procedure codes that clearly indicated the case as being a replacement. The "other cases" in each DRG had no such codes and likely reflect a combination of replacement cases that are incompletely coded and either initial implants (DRGs 115 and 116) or revisions (DRG 117).

Table B-7.—Pacemaker Replacements: Mean Charges And Number Of Cases

	Mean Charges	# Of Cases
DRG 115, Identified As Replacements ..	$14,978	195
DRG 115, Other Cases	13,711	7,079
DRG 116, Identified As Replacements ..	10,051	1,575
DRG 116, Other Cases	10,625	48,462
DRG 117, Identified As Replacements ..	8,428	705
DRG 117, Revision Without Replacement	4,449	4,303
DRG 118, All Cases	6,645	8,100

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Conclusions Concerning Pacemaker Replacement

- Replacement cases in DRG 115 have average charges similar to the charges for other cases in DRG 115. This likely reflects the fact that resource use is predominantly determined by diagnosis.
- Cases in DRG 117 that involve replacement have significantly greater charges than the cases that just undergo revision.
- There are significant numbers of pacemaker replacements classified into DRG 116 that could also be classified into DRG 117 or 118. Although the replacement cases in DRG 116 have charges similar to other cases in the DRG, this may reflect a disproportionate number of dual chamber pacemakers in the replacement group.

Recommendation

Prior to recalibration, the DRGs involving implantation of cardiac pacemakers (currently DRGs 115 through 118) should each be restructured into two DRGs, one for cases involving dual-chamber or functionally similar pacemakers, and one for cases receiving other single-chamber pacemakers. New ICD-9-CM procedure codes should be created to distinguish between these types of cases. A mechanism should be established to evaluate the appropriateness of all implants involving dual-chamber or functionally similar pacemakers. In the initial year of this new classification, the weights for all pacemaker DRGs should be calculated using charge data from the PATBILL file

Table B-8.—Description Of The New Pacemaker DRGs Based On Recommendations 25 and 26

DRG	Description
i	Initial implantation or replacement of a dual-chamber or functionally similar cardiac pacemaker in a patient with myocardial infarction, congestive heart failure or shock.
ii	Initial implantation or replacement of other cardiac pacemaker in a patient with myocardial infarction, congestive heart failure or shock.
iii	Initial implantation of a dual-chamber or functionally similar cardiac pacemaker in a patient without myocardial infarction, congestive heart failure or shock.
iv	Initial implantation of other cardiac pacemaker in a patient without mycardial infarction, congestive heart failure or shock.
v	Replacement of cardiac pacemaker with a dual-chamber or functionally similar cardiac pacemaker in a patient without myocardial infarction, congestive heart failure or shock.
vi	Replacement of cardiac pacemaker with other cardiac pacemaker in a patient without myocardial infarction, congestive heart failure or shock.
vii	Permanent cardiac pacemaker system revision except replacement.

and data on cost differences between pacemaker types.

Recommendation

Prior to recalibration, the cases involving replacement of a permanent cardiac pacemaker, except those with myocardial infarction, congestive heart failure, or shock, should be reassigned to DRGs that include only pacemaker replacements.

IMPLANTABLE DEFIBRILLATOR

Introduction

The implantable defibrillator is a new medical device used in the treatment of some life-threatening ventricular arrhythmias. It has been approved for treatment for individuals who have had a documented episode of life-threatening ventricular tachyarrhythmia or cardiac arrest not associated with myocardial infarction, and who, upon electrophysiologic testing, have an inducible tachyarrhythmia that is unresponsive to medication or surgical therapy. Discharges involving implantation of the device are assigned to DRG 104 ("Cardiac Valve Procedure with Pump and With Cardiac Catheterization").

Utilization

As of June 1984, 323 patients had received an implantable defibrillator (ID) at one of 24 medical centers. Ninety-one other patients received the leads only (while in the process of undergoing some other thoracic surgery), in anticipation of their probable eventual need for the device. Under current indications for the device's use, as many as 16,800 Medicare beneficiaries could be candidates, and 250 centers with electrophysiologic testing units could potentially offer the device.

Physician interviews suggest that clinical indications for the implantable defibrillator will eventually be broadened to include patients with congestive heart failure, ventricular arrhythmias following myocardial infarction, and any patient with a complex arrhythmia rather than just sudden-death survivors. Device costs, the need for electrophysiologic studies, and the necessity of thoracic surgery for ID implantation currently limit the use of the device, but ultimately, many more Medicare patients might be recipients of the device.

Costs, Payments, and DRG Classification

ProPAC believes that cases involving implantation of the device should be assigned to a unique DRG rather than to DRG 104 for a number of reasons. First of all, data from eight hospitals suggests that the device itself accounts for over 50 percent of total discharge costs (list price of the device is $14,500). To avoid significant payment inequities across hospitals in such cases, the labor portion and non-labor portion of the standardized amounts should be adjusted to reflect the labor related and non-labor related shares of costs (see "Changes in the Standardized Amounts for DRGs Involving Expensive Devices"). This can only be accomplished if the defibrillator cases are assigned to a unique DRG. Secondly, the diagnoses and procedures for these cases are unlike those of discharges in other DRGs. Because the device is new, good historical data on costs and charges are not yet available. Assignment to a unique DRG would facilitate collection of this important data.

As the implantable defibrillator becomes more widely used, additional adjustments to DRG classification may be required for these cases. For example, techniques are being developed for percutaneous implantation of the device, a less invasive and less costly method than thoracic surgery. Some patients may not require placement of a new device, instead requiring only lead placement or the revision or removal of an existing device. Such cases will likely incur costs that are significantly different than initial implants. It will be important that new ICD-9-CM codes currently under consideration by the Health Care Financing Administration allow differentiation and monitoring of these cases. Presently, there is only a single ICD-9-CM code identifying use of the device (Procedure code 37.99, "Implantation of Cardiac Defibrillator").

Recommendation

Implantable defibrillator cases should be assigned to a unique DRG. The labor and nonlabor portions of the standardized amounts should be redefined for this new DRG to reflect the labor related and nonlabor-related shares of costs for these cases.

PENILE PROSTHESES

Analysis

A variety of medical and surgical techniques are used in the treatment of impotence. Implantation of a penile prosthesis (either a semi-rigid or inflatable model) is the most commonly accepted surgical procedure for this problem. The manufacturer of one inflatable model requested that ProPAC examine the appropriateness of payments for this technology, presenting evidence that cases involving penile prostheses in general, and the inflatable model in particular, have significantly higher costs than the average case in DRG 341.

The issues concerning DRG 341 clearly reflect a problem of DRG heterogeneity. One solution would be reclassification of these discharges. Based on the staff analysis of expensive devices, however, the following factors should be considered in any reclassification decision (see also paper on expensive devices in this appendix).

Clinical Coherence

DRG 341 (Penis Procedures) is a surgical DRG that includes all cases with a principal diagnosis related to Diseases and Disorders of the Male Reproductive System (MDC 12) and that involve one of the following surgical procedures:[10]

close ureth fistula nec
hypo-epispadius repair
ureth reconstruction nec
ureth stricture release
penile biopsy
local excis penile les
amputation of penis
suture penile laceration
release of chordee
construction of penis
reconstruction of penis
replantation of penis
penile repair nec
sex transformat op nec
incision of penis
division of penile adhes
inset int penile prosth
remove int penile prosth
penile operation nec
male genital op nec

Although all these procedures involve the penis, they demand different amounts of operative time and other hospital resources. The Commission therefore considered two clinical issues: First, should clinical coherence in this DRG be evaluated in terms of patient characteristics, surgical procedures, or both? Second, if surgical procedures are considered, is this DRG clinically coherent?

[10]The abbreviation "nec" means not elsewhere classified.

Definition of Device Group(s)

Inflatable penile prostheses are distinct from the semi-rigid (or maleable) models. There should be no problem in uniquely classifying a particular device into one of these two categories.

The Ability of ICD-9-CM To Identify Models of Devices and the Clinical Criteria for Implantation

ICD-9-CM does not currently distinguish between inflatable and semi-rigid models, although separate codes were proposed by the ICD-9-CM Coordination and Maintenance Committee. ICD-9-CM diagnostic codes can identify the clinical indications for implantation.

Heterogeneity of Costs

Using the coefficient of variation of charges as a measure of heterogeneity, the cases in DRG 341 appear relatively homogenous (CV=57 percent in DRG 341; average CV=79 percent for surgical DRGs and CV=96 percent for medical DRGs). Nevertheless, there appear to be significant differences among subgroups of cases due to at least two heterogeneity problems:

The Grouping of Device Cases and Non-Device Cases.—The expensive devices analysis has demonstrated that in many DRGs, cases involving devices have significantly greater charges than other cases in the same DRG. As shown in Table B-9 this relationship is true in DRG 341.

The Multiple Models Problem.—Although we are currently unable to distinguish the type of device for cases in the 1984 PATBILL, there are

Table B-9.—Differences Between Prosthesis Cases And Other Cases In DRG 341

	Mean Charges	Coefficient Of Variation (Of Charges)	Number Of Cases
Penile Prosthesis Cases	$4,932	45	3,928
Other Cases In DRG 341	3,640	61	8,348
All Cases In DRG 341	4,053	57	12,276

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

likely to be significant differences in costs between cases involving a semi-rigid prosthesis and those involving an inflatable model. This is related to the price of the prosthesis (inflatable models range from $1,980 to $3,000; semi-rigid models from $530 to $1,120) and the length of hospital stay (inflatable models require a significantly longer period of post-operative care).

Total Costs to the Medicare System

The current DRG classification gives hospitals a financial disincentive to implanting the inflatable model. Although use of this device and therefore total Medicare payments may increase if the DRG were reclassified based on type of device, the Commission has no data from which to estimate the magnitude of this change.

Quality of Patient Care and the Likely Benefits of Reclassification

The inflatable prosthesis seems to be the device of choice in patients with paraplegia/quadriplegia and urologic conditions which require cystoscopy. The model is contraindicated in patients with artificial urinary sphincters. In other cases, the choice of a prosthesis is based largely on physician and/or patient preference.

Number or Distribution of Medicare Cases Involved

In fiscal year 1984 there were 3,928 Medicare discharges involving the implantation of a penile prosthesis. The number of potential Medicare candidates for this procedure may, however, be much greater.

Number or Distribution of Hospitals

The manufacturer of one inflatable device has provided to the Commission copies of letters from hospitals stating they have stopped implanting inflatable penile prostheses because of inadequate PPS payments. Table B-10 demonstrates the urban/rural and teaching/non-teaching distribution of prosthesis cases (both inflatable and semi-rigid) under Medicare.

Table B-10.—Hospital Differences For Cases Involving Penile Prostheses

Hospital Type	Number Of Cases	Percent
Urban:		
Major Teaching	567	14.5
Minor Teaching	1,361	34.8
Nonteaching	1,568	40.1
Rural:		
Major Teaching	13	0.3
Minor Teaching	43	1.1
Nonteaching	358	9.2
Total	3,910	100.0%

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Conclusions

The cases in DRG 341 involving implantation of a penile prosthesis should be reclassified into a unique DRG for several reasons. First, as currently defined, DRG 341 is not clinically coherent. Although all the patients undergo an operation related to the penis, many of the procedures are quite distinct from one another and are performed for markedly different medical indications.

Second, penile prosthesis cases utilize significantly greater hospital resources than other cases in the same DRG. The difference in charges, estimated from the 1984 PATBILL at about 35 percent, is due largely to the cost of the prosthesis. Such a large difference was probably not recognized during the development of the DRGs. Hospital resources were originally measured using length of stay whereas these cases have high costs despite short lengths of stay.

Third, as discussed in detail under Recommendation 24, the high nonlabor costs in the prosthesis cases result in payment inequities across hospitals. To avoid these inequities, cases with expensive devices should not be classified with non-device cases. In addition, the labor portion and nonlabor portion of the standardized amounts should be adjusted to reflect the high nonlabor costs of the device.

Recommendation

Prior to recalibration, cases involving the implantation of a penile prosthesis should be removed from DRG 341 and reassigned to a unique DRG. The labor portion and nonlabor portion of the standardized amounts should be redefined for this new DRG to reflect the labor related and nonlabor related shares of costs for these cases.

MAGNETIC RESONANCE IMAGING

Magnetic Resonance Imaging (MRI) is a relatively new technology that has been approved by the FDA for producing . . . "images [that] display the internal structure of the head and body and, when interpreted by a trained physician, can yield information that can be useful in the determination of a diagnosis." The technology has been used in humans by researchers since the mid 1970s. MRI became a covered service for most indications in Medicare beneficiaries in November of 1985. Thus, the costs and charges related to MRI were not in the data sets used to develop DRGs or weights. In anticipation of the coverage decision and a need for Medicare to recognize this new technology in the prospective payment system, ProPAC has examined a number of payment issues concerning MRI.

The Costs and Utilization of MRI Scanning

Since MRI is a new and continually evolving technology, accurate cost and utilization data are not readily available. ProPAC staff began its analysis by synthesizing cost and utilization information from a number of sources including the medical literature, reports from hospital and insurance groups, the participants in a ProPAC panel on MRI and other experts in the field. Copies of preliminary estimates were then provided to numerous experts, including the ProPAC MRI panelists, all the manufacturers of MRI, the relevant professional and hospital groups, and others. Based on further comments from these experts, ProPAC modified its original estimates and has summarized the data in Table B-11. The average cost (operating and capital) of an MRI scan in an "efficiently run scanner" is estimated to be $335.

Most of the values in Table B-11 are highly sensitive to a number of factors used in the calculations. These factors should be considered in evaluating costs and utilization:

Annual Operating Costs: The fixed operating costs vary with the type of MRI scanner and the number of shifts it is operated each day.

Initial Capital Costs: The capital costs vary with the type of MRI scanner, its location (permanent or mobile), and the degree to which the facility must be renovated.

Table B-11.—MRI Costs And Utilization

Annual Operating Costs:	
Fixed	$425,000
Variable	$23
Initial Capital Costs:	
Equipment Acquisition	$1,500,000
Facility Preparation	450,000
Scans:	
Av. Scans Per Week (Per Year) For All Scanners	45(2,250)
Av. Scans Per Week (Per Year) For An Efficiently Run Scanner	55(2,750)
Costs Per Scan For An Efficiently Run Scanner:	
Operating	178
Capital[a]	158
Total	335

[a]Capital is assumed to be 100 percent debt financed at 10 percent interest over a period of 6 years.

SOURCE: ProPAC estimates.

Volume of Scans: The volume of scans performed during a given time period is probably the most important factor in determing average costs. ProPAC has chosen 55 per week as an efficient level.

Interest Rate: The interest rate facing an individual hospital depends on the bond markets at the time and whether the institution is tax-exempt. ProPAC has chosen an average value of 10 percent.

Useful Life: Approximately one-fourth of the capital costs for MRI are estimated to be for facility preparation and are usually depreciated over a period of 15 to 30 years. An MRI scanner may only have a useful life of 5 years. ProPAC has chosen an average value of 6 years for all capital expenditures.

Salvage Value: Hospitals are permitted to depreciate the difference between initial price paid for capital items and the estimated salvage value at the end of useful life. Since the salvage value is extremely difficult to calculate at this time, ProPAC has calculated capital costs assuming no salvage value. Average cost estimates would decrease if a salvage value were included.

Debt vs. Equity Financing: The ProPAC add-on assumes 100 percent debt financing, although hospitals are likely to use less than this amount.

Reducing the debt percentage below 100 would decrease estimates of capital costs in the form of interest expense.

Substitution for Other Hospital Resources: PPS pays individual hospitals for each discharge rather than for specific services rendered. Any additional payment for a new technology should therefore take into consideration the degree to which that technology substitutes for other hospital resources. It appears to be too early in the adoption and diffusion of MRI to develop accurate estimates of this substitution factor. Based on discussion with some experts, the Commission has made the assumption that MRI may substitute for 30 percent of other hospital operating costs (not capital costs) during patient stays.

In conclusion, MRI is an expensive new diagnostic technology. In an efficiently run facility, an average scan probably costs about $335, although this value is highly sensitive to a number of key variables used in the calculation. The technology is very likely to increase the costs per Medicare discharge, although ProPAC assumes that MRI will substitute for perhaps 30 percent of other hospital resources.

Payment Options Under PPS

A recent analysis has demonstrated that the percent of scanners currently located within hospitals is significantly lower than for Computed Tomography (CT) scanning.[11] This finding is likely due to a number of factors, including delays in coverage by many third party payers, certificate-of-need programs, the prospective payment system, and characteristics of the technology itself. ProPAC is concerned that because of these factors, Medicare beneficiaries may face limited access to this important new technology. The Commission therefore examined several different options to pay for MRI under PPS.

[11]Steinberg, E.P., Sisk, J.E. and Locke, K.E., "Xray CT and Magnetic Resonance Imagers: Diffusion Patterns and Policy Issues, *NEJM* 313:859-864, 1985.

Recalibration of DRG Weights Without Other Adjustments

One possible payment mechanism is that MRI could become a covered service for Medicare beneficiaries without additional payment for the technology. In fact, this is the payment mechanism that was chosen by the HCFA during the time that ProPAC was evaluating the issue. Payments for cases involving MRI are determined by the relevant standardized amount(s), DRG weight(s) and adjustments (i.e., for wages, indirect teaching and outliers). Since the standardized amount includes an update factor, and since ProPAC's recommendation for an update factor includes a component for cost increasing and quality enhancing technologies (i.e., within the Discretionary Adjustment Factor—DAF), then hospitals are already provided some additional funds for using new technologies such as MRI. These funds are not earmarked for new technologies generally or MRI specifically, however, and can be applied at the hospital's discretion.

As MRI is used for more beneficiaries, the charges for scanning will appear in the Medicare data bases used for recalibration. Over time the weights for individual DRGs will more accurately reflect the relative costs of MRI.

This payment option has the advantage that it treats MRI like other technologies for which no specific adjustments are made in DRG classification or weight. With annual recalibration, however, there may be up to a two year lag between the time that a change occurs in the use of MRI and when that change is reflected in the weights. If recalibration occurs less often, the lag period will be even greater. In addition, the DRG weight (and therefore the payment) for an individual discharge is identical whether or not an MRI scan is performed and whether or not the hospital owns the scanner.

Adjust DRG Weights Other Than Through Recalibration

A second payment option for MRI is to adjust immediately all the weights in DRGs that would include cases having undergone MRI. This would prevent the long lag period described above. To calculate these new weights would require esti-

mates of the average additional costs per discharge in a case that undergoes scanning and the percentage of all cases in each DRG that get a scan. For a new technology that is applied to a well defined patient group and is the major determinant of hospital resource use (for example, extracorporeal shock wave lithotripsy), this estimation can be based on reviewing a limited sample of cases. The difficulty with MRI is that the technology is applied to patients with different disease processes and the resulting discharges are classified into many DRGs. Furthermore, MRI might add to costs for cases in some DRGs while reducing total costs for cases in other DRGs. Thus to calculate the appropriate changes in all the weights of DRGs in which cases undergo MRI scanning would require data on large samples of patients in each of the relevant DRGs. Since such data are not currently available for MRI, reweighting individual DRGs is not feasible at this time.

Cost Pass-Through for MRI

A third payment option for MRI is to reimburse hospitals on a reasonable cost basis (i.e., as a cost pass-through).[12] Such a mechanism, however, fails to provide hospitals with appropriate incentives for providing cost-effective care and was dismissed by the Commission.

Payment Add-on

A final approach to paying for MRI involves an additional payment (hereafter termed an "add-on") for each scan performed for a Medicare beneficiary. This payment mechanism has several advantages. The add-on would direct payments specifically to those discharges in which an MRI scan is performed. As a result, hospitals with MRI scanners would likely receive higher payments than if an add-on did not exist. These higher payments for hospitals with scanners would likely encourage the adoption and diffusion of the technology, making it more accessible to Medicare beneficiaries. The add-on could be implemented immediately and would not necessarily face the longer lag period associated with recalibration. One drawback to the add-on, however, would be a financial incentive for hospitals to provide more scans.

After evaluating all these payment options for MRI, the Commission determined that an add-on payment would be most appropriate. In the following pages are the factors that the Commission considered in developing the final recommendation.

Key Factors in Calculating the Add-on

The Capital Issue

One Commission goal in calculating the add-on was to pay hospitals the same amount for an MRI scan regardless of whether they own a scanner or purchase scans from other providers. The current pass-through for capital related costs, however, complicates this concept. If ProPAC recommends one add-on payment regardless of MRI ownership, the hospital with its own scanner would receive the add-on and a capital pass-through. In contrast, the hospital that purchases scans from another provider would receive only the add-on, although the price it pays for a scan is likely to reflect significant capital related costs.[13] Thus a single add-on payment would encourage hospitals to buy MRI scanners rather than purchase scans from other hospitals or free-standing units.

An approach to this problem would be for ProPAC to recommend two add-ons—one for a hospital that owns a scanner and receives a capital pass-through and a larger add-on for institutions that purchase scans from other sources. The two add-ons would increase the administrative burden of the mechanism to a small extent but would leave the payment process neutral to the location of the scanner. If in the future capital costs are included in PPS payments, however, only one add-on would be necessary.

The Commission also considered but rejected a policy whereby all MRI capital costs, including those currently excluded from PPS and paid on a reasonable cost basis, would be paid via an add-on. Although this mechanism would treat all

[12]Capital costs are currently paid in this manner, although changes are likely in the future.

[13]Experts generally estimate that capital represents approximately 50 percent of total scanner costs.

MRI capital costs in a consistent manner, the policy may not be necessary in light of many proposals to include capital related costs under PPS. The Commission therefore rejected this policy option but plans to reconsider its merit in the future if capital payments are not incorporated into PPS.

The Amount of the Add-on

The Commission also determined that the add-on should reflect the average cost of a scan performed at an efficiently run facility. The Commission estimated this value at $335 (see Table B-11). As discussed earlier, it is important to adjust this amount to reflect the degree to which MRI substitutes for other hospital resources. Using a value of 30 percent substitution for operating costs and no substitution for capital costs, the Commission chose an add-on of $124 for institutions that own their own scanners (i.e., are also eligible for the capital pass-through) and $282 for hospitals that purchase scans from other providers.

Payment to the Discharging Hospital, Not to the MRI Scanner

Although an add-on payment changes the financial incentives that hospitals face under PPS, the Commission believes, to the extent possible, that the add-on should still encourage hospitals to provide quality services with the fewest resources. By making the add-on payment to the discharging hospital, Medicare remains neutral to the hospital decision about buying a scanner vs. purchasing scans from another provider.

Adjusting Total Medicare Payments

The Commission decided that any payment mechanism for MRI must not result in an additional increase in total Medicare payments. To achieve this goal, some other Medicare payment must be reduced by approximately $27 million, the estimated total of all add-on payments in fiscal year 1987.[14] Three potential areas for payment reductions were examined:

Indirect Medical Education.—The adjustment for indirect medical education is provided to hospitals to compensate for the costs (in addition to wages and salaries) associated with graduate medical education. Although one factor that likely increases costs in these institutions is the use of new technologies, MRI is by no means limited to teaching hospitals. Significant numbers of scanners are now located in non-teaching hospitals and in free-standing imaging centers. Thus, paying for the MRI add-on by reducing the indirect teaching adjustment would not be equitable.

Outliers.—As currently constructed, outlier payments are calculated to pay for the marginal costs of care beyond designated thresholds of charges or lengths of stay. Although some cases may qualify as outliers because a new technology is used, this is not likely to be the situation for a majority of outliers. Paying for an MRI add-on by reducing outlier payments would thus be an indirect and inequitable method.

DAF.—In its calculation of the Update Factor, ProPAC has identified a component of the DAF (Discretionary Adjustment Factor) for "Scientific and Technological Advancement." This component should reflect a social concensus regarding the amount to be set aside for technological advancement, balancing the medical benefits against the costs of such advancements. The Commission believes that it is most appropriate to reduce this amount for "Scientific and Technological Advancement" in order to provide the payments earmarked specifically for MRI. Accordingly, the Commission's current recommendation for the DAF (see Recommendation 2) has been adjusted downward to reflect the $27 million in add-on payments estimated for fiscal year 1987.

Adjusting the DRG Weights To Prevent Overpayment for MRI

The Commissioners are also concerned about possible overpayment for cases involving MRI. If the DRG weights are recalibrated during the next two years,[15] and if the costs (or charges) for MRI are reflected in the data used for that purpose, then payment for MRI could be included in both the DRG payment and the add-on. This

[14] The $27 million figure was estimated for FY 1987 assuming add-ons of $124 and $282 as described above, 500 scanners in operation, 50 percent of scanners owned by hospitals, an average of 45 scans per week for all scanners, 70 percent of inpatient scans performed at the discharging hospital, 40 percent of all scans being for Medicare beneficiaries, and 35 percent of all scans done on inpatients.

[15] Although ProPAC recommends annual recalibration, the law currently states that it must be done at least every four years.

does not appear to be a major problem, however. Consider what happens in each of the next three years assuming that MRI became a covered service in November 1985 and that an add-on is implemented on October 1, 1986.

Year 1 of Add-on, fiscal year 1987.—The DRG weights for fiscal year 1987 will likely have been recalibrated with Medicare PATBILL data from fiscal year 1985, a period when probably few scans were performed on beneficiaries. Therefore it is unlikely that the add-on will result in overpayment for these cases.

Year 2 of Add-on, fiscal year 1988.—The DRG weights for fiscal year 1988 will likely have been recalibrated with Medicare PATBILL data from fiscal year 1986. Some cases in this data set will have undergone MRI scanning (since the procedure was covered in Nov. 1985) but we will not have detailed data on use of MRI by DRG.[16] Thus there could be some overpayment for MRI cases during the year. The magnitude of the overpayment, however, is likely to be small.

Year 3 of Add-on, fiscal year 1989.—The DRG weights for fiscal year 1989 will likely have been recalibrated with Medicare PATBILL data from fiscal year 1987 (the first year of the add-on). MRI utilization information will therefore be available for individual DRGs and adjustments could be made in DRG weights to prevent overpayment.

In summary, adjustments can be made in DRG weights for fiscal year 1989. Prior to that time adjustments would be difficult to make but would likely be unnecessary.

[16]Currently MRI does not have a unique ICD-9-CM code to identify its use in beneficiaries. Even if such a code were assigned in the near future, however, hospitals have little incentive to record MRI on the Medicare bill until the time that an add-on is implemented.

Recommendation

For a period of three years, Medicare should pay hospitals an additional amount (hereafter termed an add-on) for each covered magnetic resonance imaging (MRI) scan performed on an inpatient Medicare beneficiary in a PPS hospital. Under existing capital payment policy, the add-on for fiscal year 1987 should be $124 for each scan performed on beneficiaries in institutions where Medicare pays for the capital costs of an MRI scanner and $282 for each scan performed on beneficiaries in other PPS hospitals. In fiscal year 1988 and 1989 the add-on amounts for all hospitals should be recalculated to reflect any change in the average cost of an efficiently produced scan and any changes in capital payment policy.

EXTRACORPOREAL SHOCKWAVE LITHOTRIPSY

Extracorporeal Shockwave Lithotripsy (ESWL) is a new, non-invasive technology which uses shock waves to eliminate urinary tract stones. When DRGs were initially developed, ESWL was not a covered service for Medicare beneficiaries. In 1985, ESWL was covered and the cases were assigned to the medical DRGs 323 (Urinary Stones age > 69 and/or C.C.) and 324 (Urinary Stones age <70 w/o C.C.).

Since discharges are classified into DRGs 323 and 324 based on the age of the patient and/or presence of complications or comorbidities, ProPAC surveyed the literature and professional groups to determine if these distinctions were justified medically. To date, we have not found any specific medical reasons for this DRG split for ESWL discharges. The ESWL clinical protocols used during the investigational phase, however, prevented most patients with comorbidities or complications from receiving ESWL treatment. Furthermore, cases with complications that require percutaneous lithotripsy or conventional surgery are grouped into higher weighted DRGs 304 and 305.

Review of Initial ProPAC Analysis

ProPAC staff obtained information on ESWL procedure costs and other routine and ancillary hospital service charges from the American Hospital Association (AHA), the American Urological Association (AUA), and seven ESWL providers. This information is summarized in Table B-12.

Since the cost estimates in Table B-12 were derived from multiple sources, several aspects of the table require explanation.

Operating Costs and Charges

ESWL Procedure Cost Per Case.—The procedure costs per case vary with the number of ESWL shocks delivered per case. In the future, as more complicated cases are treated by ESWL, the costs per case may increase because of increased use of the equipment and increased use of the disposable ESWL electrodes. The cost of an electrode is in the $200 to $300 range. A typical patient may

Table B-12.—Operating Costs and Payments For ESWL Discharges

	ProPAC Estimates[a]	Georgetown Data[b]
A. Utilization Assumptions:		
1. Number Of Cases/Year	1,200	1,042
2. Approximate Number Of Cases/Week	23	20
3. Number Of ESWL Shocks/Case	1,100	1,594
B. ESWL Procedure Costs:		
1. Salaries	$87,085	$161,301
2. All Other Costs	$713,559	$1,050,715
3. Total ESWL Costs/Procedure	$667	$1,163
C. Other Routine & Ancillary Service Costs[c]:		
1. Room	$777	$637
2. All Other Services	$1,268	$1,320
3. Total Rtn. & Anc. Svc. Costs/Case	$2,045	$1,957
D. Total Costs/Discharge	$2,712	$3,120
E. Payments:		
1. DRG 323 Payment/Case	$2,655	$2,557
2. Payment As % Of Costs	98%	82%
3. DRG 324 Payment/Case	$1,857	$1,787
4. Payment As % Of Costs	68%	57%

[a]Based on information from the American Hospital Association, the American Urological Association, and seven ESWL providers.
[b]From the Institute For Health Policy Analysis/Georgetown University Medical Center National Health Services and Practice Patterns Survey—Extracorporeal Shockwave Lithotripsy Operating Cost and Payments Study.
[c]Other routine & ancillary hospital service costs were calculated by multiplying the average of reported hospital charges by 0.7.

require as many as 3 electrodes per treatment. On the other hand, the average cost of treating a patient with ESWL is extremely sensitive to the number of procedures performed. While the cost data used in the ProPAC analysis reflect, on average, a relatively low volume of cases in institutions with lithotripters, as hospitals utilize their equipment more efficiently, costs per case are likely to decrease.

Separating Medicare Part A Operating Costs from Part B Costs.—Some providers included urologist and anesthesiologist fees as part of their operating costs. These fees (or salaries) are paid under Medicare Part B and therefore are not allowable under Part A operating cost. Line B-1 represents salaries of non-physician personnel associated with the ESWL procedure.

Separating Medicare Part A Operating Costs from Capital Costs.—One of the most difficult parts of constructing Table B-12 was to exclude capital costs. Some providers that purchased equipment reported interest on debt as an operating cost. Other providers leased equipment and reported lease fees as operating costs. Both interest on debt and lease fees are subject to Medicare capital pass-through adjustments on a reasonable cost basis. Line B-2 reflects non-salary ESWL operating costs exclusive of capital and differs significantly from the amounts identified by some private sector groups.

Other Routine and Ancillary Hospital Costs.—The cost and charge information used in this analysis was collected during and immediately after the ESWL investigational phase. Although costs are likely to change in the future, the direction of the change remains unclear. Length of stay and the use of ancillary services might decrease for uncomplicated patients no longer on protocols. However, as the procedure is applied to larger stones and sicker patients, both length of stay and the use of ancillary services could increase.

Estimating Costs for Other Routine and Ancillary Hospital Services.—ProPAC had access to providers' routine and ancillary service *charges* for ESWL cases. We estimated *costs* at 70 percent of charges based on previous experience with Medicare data.

Capital Cost

The cost of an ESWL unit is in the range of $1.7 million. Currently, capital costs (including equipment, interest, renovation, etc.) are paid on a reasonable cost basis. The Commission has recommended that the Secretary initiate a transition to all-inclusive prospective prices that combine operating and capital cost components in a single prospective payment per case for hospitals. (See Recommendation 5.)

Payments

ProPAC's analysis includes an estimation of Medicare payments for both DRG 323 and 324. The results of this analysis show average Medicare fiscal year 1986 payments of $2,655 for discharges in DRG 323 and $1,857 for discharges in DRG 324. These amounts reflect the average PPS payments to the seven hospitals that provided ProPAC with cost data. The payments include both the hospital specific and federal portions, with adjustments for wage rates and indirect teaching costs. Part E of Table B-12 represents average payments in DRGs 323 and 324, expressed in absolute terms and as a percentage of costs. The table demonstrates that payments in DRG 323 approximate costs (80 to 100 percent—see Row E-2) while payments in DRG 324 are significantly below costs (60 to 70 percent—see Row E-4).

IHPA Data

The Institute for Health Policy Analysis (IHPA) of Georgetown University Medical Center began a study into the costs of ESWL. The final column in Table B-12 provides a preliminary summary of this study, with cost data from 16 institutions that currently have lithotripters.

In comparing the two sets of data, ProPAC's assumptions closely match IHPA's. However, there are some differences to consider. The ProPAC analysis included information from both Medicare and non-Medicare patients; IHPA's included Medicare only. ProPAC's analysis used data obtained during the FDA investigational stage. One would expect these cases, on average, to have a longer LOS, to have more diagnostic

tests performed, and to have younger, healthier patients with smaller stones than those in the post-investigational stage (IHPA's study). Finally, the IHPA study yielded more shocks per case and higher total salaries and wages than in the ProPAC analysis. IHPA found that on average, payment in DRG 323 is about 82 percent of costs while payment in DRG 324 is about 57 percent of costs.

Although these data reflect more recent information from a larger number of providers than originally examined by ProPAC staff, several factors must be considered when evaluating these additional data. First, these are only preliminary figures and require further verification from the institutions. Second, ProPAC staff were only permitted to examine the summary information rather than institution-specific costs. Finally, both ProPAC and IHPA analyses are based on relatively low volumes of cases (approximately four per day). Since average costs are extremely sensitive to volume, and the cost data reflect a somewhat low volume of cases, either analysis could demonstrate significantly lower costs if providers increase volume over time.

Some critics of the current classification of discharges suggest that ESWL discharges would be more appropriately classified into the two surgical DRGs 304 and 305 (kidney, ureter & major bladder procedures for non-malignancy age >69 and/or C.C. and <70 w/o C.C., respectively). The American Urological Association believes that such a classification would improve the quality of patient care by encouraging the treatment of these patients by urologists, rather than by physicians without surgical training. If cases were grouped this way, however, payments would likely average over 200 percent of costs.

Conclusions

- Judgments regarding the appropriateness of payment amounts for ESWL cases relate to assumptions about the utilization of the procedure, the changing indications for the procedure, and the importance of age, complications and/or comorbidities.
- Average costs for treatment of a patient with ESWL are extremely sensitive to the number of cases treated, and current cost data are based on a relatively low volume of cases. As hospitals utilize their equipment more efficiently, costs per case are likely to decrease. Based on current costs and patterns of use:
  1. PPS payments for ESWL cases in DRG 324 are significantly lower than operating costs.
  2. PPS payments for ESWL cases in DRG 323 likely reflect between 80 and 100 percent of operating costs.
  3. PPS payments for ESWL cases in DRGs 304 and 305 would exceed over 200 percent of operating costs.

Recommendation

Prior to recalibration, cases in which extracorporeal shock wave lithotripsy (ESWL) is the principal procedure should temporarily be removed from DRG 324 and reassigned to DRG 323. The payments and costs for all cases in this DRG should be monitored to determine the appropriateness of PPS payments for operating costs. A unique procedure code should be identified for ESWL.

UPPER EXTREMITY PROCEDURES

Advances in surgical technique and prostheses for deformities/injuries of the upper extremities have made it possible for increasing numbers of elderly patients to undergo surgery of the upper extremities. At the request of the Orthopedic Community, ProPAC examined DRGs 223, 224, 228, and 229 (those dealing with upper extremity procedures) to determine whether current groupings and payments were appropriate. Concerns were raised that surgical cases involving joint prostheses or certain comorbid medical conditions were more costly than the average case. Hospitals might have disincentives to accept such cases. This is inconsistent with the goal of quality care for Medicare patients.

The following analyses were undertaken to identify groups that were clinically and fiscally more homogenous.

Analyses

DRGs 223-4

The current DRGs are:

(R-square = .01, ANOVA)

		Percent of cases	*1984 avg std charges*
223	Upper extremity procedure except humerus and hand, age>69 or c.c.	64%	$4,111
224	Upper extremity procedure except humerus and hand, age <70 w/o c.c.	36%	$3,298

To derive new groups, four variables were studied: a) Implantation of joint prosthesis; b) Diagnosis of rheumatoid arthritis; c) Complication as defined by the 1986 DRG grouper; and d) Age. Results of univariate analysis are presented in Table B-13.

Multivariate analysis shows that the following two groups best explain the observed differences among standardized charges for the variables studied:

(R-square = .13, ANOVA)

		Percent of cases	*1984 avg std charges*
a)	Upper extremity procedure except humerus and hand; w/joint prosthesis or c.c.	28%	$5,735
b)	Upper extremity procedure except humerus and hand; w/o joint prosthesis or c.c.	72%	$2,875

DRGs 228-9

The current groups are:

(R-square = .01, ANOVA)

		Percent of cases	*1984 avg std charges*
228	Ganglion cyst (hand) procedures	5%	$1,433
229	Hand procedures except ganglion	95%	$2,573

In deriving new groups, six variables were studied: a) Implantation of joint prosthesis; b) Diagnosis of rheumatoid arthritis; c) Complication as defined by the 1986 grouper; d) Age; e) Type of surgical procedure ("major" versus "minor" as defined by a national group of orthopedic physicians); and f) Type of surgical procedure (based on four groups defined by a group of Boston physicians). See Table B-14 for results of univariate analysis.

Table B-13.—Univariate Analysis For DRGs 223 And 224

	Std Total Charges			Length Of Stay		
Variable	Freq	Mean	Std Dev	Freq	Mean	Std Dev
Selected Diagnoses:						
Rheumatoid	1,463	5,156	4,671	1,464	9.38	8.02
All Others	10,207	3,462	3,296	10,223	6.36	6.82
Age Groups:						
Under Age 70	5,616	3,458	3,248	5,623	6.06	6.43
70 And Over	6,054	3,875	3,784	6,064	7.36	7.52
Complication Diagnoses:						
Complications and Comorbidities	2,268	5,539	5,621	2,269	10.12	8.80
All Other Diagnoses	9,402	3,225	2,629	9,418	5.92	6.29
Joint Procedures:						
Joint Replacement	1,321	6,598	4,335	1,321	11.21	8.94
All Other Surgery	10,349	3,302	3,244	10,366	6.17	6.56

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-14.—Univariate Analysis For DRGs 228 And 229

Variable	Std Total Charges			Length Of Stay		
	Freq	Mean	Std Dev	Freq	Mean	Std Dev
Selected Diagnoses:						
Rheumatoid	288	2,809	1,831	288	4.98	4.35
All Others	10,779	2,441	2,516	10,813	4.03	5.07
Age Groups:						
Under Age 70	6,671	2,362	2,025	6,691	3.74	4.27
70 And Over	4,396	2,583	3,083	4,410	4.54	6.02
Complication Diagnoses:						
Complications and Comorbidities	1,404	3,610	4,282	1,405	6.60	7.96
All Other Diagnoses	9,663	2,282	2,069	9,696	3.69	4.36
Joint Procedures:						
Joint Replacement	1,931	3,270	2,365	1,932	4.93	4.08
All Other Surgery	9,136	2,277	2,495	9,169	3.87	5.22

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

ProPAC identified three alternative classifications for discharges involving hand procedures. Classification 1 splits apart cases with complications/comorbidities or joint prostheses from all other cases. Classification 2 splits apart cases with complications/comorbidities or collagen vascular diseases from all others. Classification 3 splits apart cases with complications/ comorbidities or joint prostheses or collagen vascular diseases from all other cases. All these classifications explain about the same amount of variance in charges.

Classification 1 (R-square = .06, ANOVA)

	Percent of cases	*1984 avg std charges*
228 Hand procedures; with joint prosthesis or c.c.	28%	$3,321
229 Hand procedures; w/o joint prosthesis or c.c.	72%	$2,040

Classification 2 (R-square = .05, ANOVA)

	Percent of cases	*1984 avg std charges*
228 Hand procedure; with collagen vascular disease or c.c.	32%	$3,287
229 Hand procedure; w/o collagen vascular disease or c.c.	68%	$2,051

Classification 3 (R-square = .05, ANOVA)

	Percent of cases	*1984 avg std charges*
228 Hand procedure; with joint prosthesis or collagen vascular disease or c.c.	40%	$3,148
229 Hand procedure; w/o joint prosthesis or collagen vascular disease or c.c.	60%	$1,982

Other Issues

Practice Pattern Change

Some orthopedic surgeons are concerned that many patients will unnecessarily undergo multiple procedures (with accompanying increased risk of surgical/anesthetic complication) unless reimbursement amounts allow for increased costs of multiple prosthetic implants during a single surgery.

Only 163 cases of multiple prosthetic implants were found in DRGs 223, 224, 228, and 229. Further analyses may be indicated if an increasing number of Medicare patients become candidates for multiple joint prostheses.

Concomitant Nonsurgical Hip Fracture

Cases involving hand or foot procedures with associated nonsurgical hip fractures had disparately high charges. The 125 cases in DRGs 225, 228 and 229 with diagnoses of pertrochanteric or transcervical fracture of the femur had average standardized charges much higher than the average charge for other cases in the same DRG. Those cases are more appropriately classified in DRG 236 (medical hip fracture).

	Average std charges
Hip fractures, DRGs 225, 228-9	$7,491
Other cases, DRGs 225, 228-9	$2,565
DRG 236 cases (Medical hip fractures)	$4,418

Microvascular Surgery

Some orthopedic surgeons are concerned that current DRG groupings do not compensate adequately for such resource intensive microvascular procedures as reattachment of a hand.

Preliminary analysis showed only 39 such cases within DRGs 228 and 229. If more cases are found, further analysis may be necessary.

Summary

- Current DRG groups 223/224 and 228/229 poorly distinguish differences in standardized charges for the cases they include.
- Cases combining an upper extremity or foot procedure with a nonsurgical hip fracture have charges significantly greater than the average in DRGs 223, 224, 225, 228 and 229.
- Although multiple joint replacements are more costly than average cases in the same DRG, the number of these multiple procedure cases is not large enough to make reclassification worthwhile at present.

Recommendation

Prior to recalibration, cases involving procedures of the upper extremity that are currently classified in DRGs 223, 224, 228, and 229 should be reassigned based on anatomical location and the presence of systemic collagen vascular disease or implantation of joint prostheses or complications and/or comorbidities. Nonsurgical hip fracture cases currently being assigned to DRGs 223, 224, 225, 228, and 229 should be reassigned to the appropriate medical DRG.[17]

[17]See Tables B-15, 16, 17, and 18 for detailed description of diagnoses and procedures to be included in the proposed DRGs.

Table B-15.—Proposed DRG 223: Upper Extremity Procedure Except Humerus and Hand; With Joint Prosthesis Or Complications And/Or Comorbidities

Operating Room Procedures
8181 SHOULDER ARTHROPL-PROSTH
8184 ELBOW ARTHROPLAST-PROSTH

Or

Operating Room Procedures And C.C.
7703 RADIUS & ULNA SEQUESTREC
7723 RADIUS/ULNA WEDG OSTEOTO
7733 RADIUS/ULNA DIVISION NEC
7783 PART OSTECT-RADIUS/ULNA
7793 TOT OSTECT-RADIUS/ULNA
7803 BONE GRAFT-RADIUS/ULNA
7833 RADIUS/ULNA LENGTH CHNGE
7843 OTHER RADIUS/ULNA REPAIR
7853 INT FIXATION-RADIUS/ULNA
7873 OSTEOCLASIS-RADIUS/ULNA
7893 OTHER OPS ON RADIUS/ULNA
7912 CL RED-INT FIX RAD/ULNA
7922 OPEN REDUC-RADIUS/ULN FX
7932 OP RED-INT FIX RAD/ULNA
7942 CLS RED-RADIUS/ULN EPIPHY
7952 OP RED-RADIUS/ULN EPIPHY
7962 DEBRID OPN FX-RADIUS/ULN
7981 OPN REDUC DISLOC-SHOULDR
7982 OPEN REDUC-ELBOW DISLOC
7992 RADIUS/ULNA INJ OP NOS
8011 OTH ARTHROTOMY-SHOULDER
8012 OTH ARTHROTOMY-ELBOW
8041 SHOULDER STRUCT DIVISION
8042 ELBOW STRUCTURE DIVISION
8071 SHOULDER SYNOVECTOMY
8072 ELBOW SYNOVECTOMY
8091 EXCISION OF SHOULDER NEC
8092 EXCISION OF ELBOW NEC
8123 ARTHRODESIS OF SHOULDER
8124 ARTHRODESIS OF ELBOW
8182 REP RECUR SHLDER DISLOC
8183 SHOULDER ARTHROPLAST NEC
8185 ELBOW ARTHROPLASTY NEC
8193 SUTUR CAPSUL/LIGAMEN ARM
8363 ROTATOR CUFF REPAIR
8444 IMPLANT ARM PROSTHESIS

Assign all cases with diagnoses 8200-82032 to DRG 236.

SOURCE: ProPAC Analysis.

Table B-16.—Proposed DRG 224: Upper Extremity Procedure Except Humerus and Hand; W/O Joint Prosthesis Or Complications And/Or Comorbidities

Operating Room Procedures
7703 RADIUS & ULNA SEQUESTREC
7723 RADIUS/ULNA WEDG OSTEOTO
7733 RADIUS/ULNA DIVISION NEC
7783 PART OSTECT-RADIUS/ULNA
7793 TOT OSTECT-RADIUS/ULNA
7803 BONE GRAFT-RADIUS/ULNA
7833 RADIUS/ULNA LENGTH CHNGE
7843 OTHER RADIUS/ULNA REPAIR
7853 INT FIXATION-RADIUS/ULNA
7873 OSTEOCLASIS-RADIUS/ULNA
7893 OTHER OPS ON RADIUS/ULNA
7912 CL RED-INT FIX RAD/ULNA
7922 OPEN REDUC-RADIUS/ULN FX
7932 OP RED-INT FIX RAD/ULNA
7942 CLS RED-RADIUS/ULN EPIPHY
7952 OP RED-RADIUS/ULN EPIPHY
7962 DEBRID OPN FX-RADIUS/ULN
7981 OPN REDUC DISLOC-SHOULDR
7982 OPEN REDUC-ELBOW DISLOC
7992 RADIUS/ULNA INJ OP NOS
8011 OTH ARTHROTOMY-SHOULDER
8012 OTH ARTHROTOMY-ELBOW
8041 SHOULDER STRUCT DIVISION
8042 ELBOW STRUCTURE DIVISION
8071 SHOULDER SYNOVECTOMY
8072 ELBOW SYNOVECTOMY
8091 EXCISION OF SHOULDER NEC
8092 EXCISION OF ELBOW NEC
8123 ARTHRODESIS OF SHOULDER
8124 ARTHRODESIS OF ELBOW
8182 REP RECUR SHLDER DISLOC
8183 SHOULDER ARTHROPLAST NEC
8185 ELBOW ARTHROPLASTY NEC
8193 SUTUR CAPSUL/LIGAMEN ARM
8363 ROTATOR CUFF REPAIR
8444 IMPLANT ARM PROSTHESIS

Assign all cases with diagnoses 8200-82032 to DRG 236.

SOURCE: ProPAC Analysis.

Table B-17.—Proposed DRG 228: Hand Procedure; With Joint Prosthesis Or Collagen Vascular Disease Or Complications And/Or Comorbidities

Operating Room Procedures
8171 HAND ARTHROPLAS W PROSTH
8186 CARPAL ARTHROPL-SYN PROS

Operating Room Procedures And C.C. Or DX In List—
0443 CARPAL TUNNEL RELEASE
7704 METACARP/CARP SEQUESTREC
7714 OTH METACARP/CARP INCIS
7724 METACAR/CAR WEDG OSTEOTO
7734 METACAR/CAR DIVISION NEC
7744 METACARPAL/CARPAL BIOPSY
7764 LOC EXC LES METACAR/CAR
7774 EXCIS METACAR/CAR-GRAFT
7784 PART OSTECT-METACAR/CAR
7794 TOT OSTECT-METACARP/CARP
7804 BONE GRFT TO METACAR/CAR
7834 CARPAL LENGTH CHANGE
7844 OTHER METACAR/CAR REPAIR
7854 INT FIXATION-METACAR/CAR
7874 OSTEOCLASIS-METACAR/CAR
7884 OTH DX PROC-METACAR/CAR
7894 OTHER OPS ON METACAR/CAR
7913 CL RED-INT FIX METAC/CAR
7914 CLOSE RED-INT FIX FINGER
7923 OPEN REDUC-METAC/CAR FX
7924 OPEN REDUCTION-FINGER FX
7933 OP RED-INT FIX METAC/CAR
7934 OPEN RED-INT FIX FINGER
7963 DEBRID OPN FX-METAC/CAR
7964 DEBRID OPN FX-FINGER
7983 OPEN REDUC-WRIST DISLOC
7984 OPN REDUC DISLOC-HAND
7993 METACARP/CARP INJ OP NOS
7994 FINGER INJURY OP NOS
8013 OTH ARTHROTOMY-WRIST
8014 OTH ARTHROTOMY-HAND/FNGR
8043 WRIST STRUCTURE DIVISION
8044 HAND JOINT STRUCT DIVIS
8073 WRIST SYNOVECTOMY
8074 HAND SYNOVECTOMY
8083 DESTRUC-WRIST LESION NEC
8084 DESTRUC-HAND JT LES NEC
8093 EXCISION OF WRIST NEC
8094 EXCISION HAND JOINT NEC
8125 CARPORADIAL FUSION
8126 METACARPOCARPAL FUSION
8127 METACARPOPHALANGEAL FUS
8128 INTERPHALANGEAL FUSION
8179 HAND ARTHROPLASTY NEC
8187 WRIST ARTHROPLASTY NEC
8201 EXPLOR TEND SHEATH-HAND
8202 MYOTOMY OF HAND
8203 BURSOTOMY OF HAND
8209 INC SOFT TISSUE HAND NEC
8211 TENOTOMY OF HAND
8212 FASCIOTOMY OF HAND
8219 DIV SOFT TISSUE HAND NEC
8221 EXC LES TEND SHEATH HAND
8222 EXCISION HAND MUSCLE LES
8229 EXC LES SFT TISS HND NEC
8231 BURSECTOMY OF HAND
8232 EXCIS HAND TEND FOR GRFT
8233 HAND TENONECTOMY NEC
8234 EXC HND MUS/FAS FOR GRFT
8235 HAND FASCIECTOMY NEC
8236 OTHER MYECTOMY OF HAND
8239 HAND SOFT TISSUE EXC NEC
8241 SUTURE TENDN SHEATH HAND
8242 DELAY SUT FLEX TEND HAND
8243 DELAY SUT HAND TEND NEC
8244 SUTUR FLEX TEND HAND NEC
8245 SUTURE HAND TENDON NEC
8246 SUTURE HAND MUSCLE/FASC
8251 HAND TENDON ADVANCEMENT
8252 HAND TENDON RECESSION
8253 HAND TENDON REATTACHMENT
8254 HAND MUSCLE REATTACHMENT
8255 CHNG HND MUS/TEN LNG NEC
8256 TRANSPLANT HAND TEND NEC
8257 TRANSPOSIT HAND TEND NEC
8258 TRANSPLANT HAND MUSC NEC
8259 TRANSPOSIT HAND MUSC NEC
8261 POLLICIZATION OPERATION
8269 THUMB RECONSTRUCTION NEC
8271 HAND TEND PULLEY RECONST
8272 PLAST OP HND-MUS/FAS GRF
8279 PLAST OP HAND W GRFT NEC
8281 TRANSFER OF FINGER
8282 REPAIR OF CLEFT HAND
8283 REPAIR OF MACRODACTYLY
8284 REPAIR OF MALLET FINGER
8285 OTHER TENODESIS OF HAND
8286 OTHER TENOPLASTY OF HAND
8289 HAND PLASTIC OP NEC
8291 LYSIS OF HAND ADHESIONS
8299 HAND MUS/TEN/FAS/OPS NEC
8401 FINGER AMPUTATION
8402 THUMB AMPUTATION
8422 FINGER REATTACHMENT
8661 FULL-THICK HAND SKIN GRF
8662 HAND SKIN GRAFT NEC
8673 ATTACH PEDICLE TO HAND
8685 SYNDACTYLY CORRECTION

Diagnosis List—For DRG 228
7102 SICCA SYNDROME
7140 RHEUMATOID ARTHRITIS
7144 CHRONIC POSTRHEUMATIC ARTHROPATHY
71934 PALINDROMIC RHEUMATISM OF HAND
7200 ANKYLOSING SPONDYLITIS
7201 SPINAL ENTHESOPATHY
72081 INFLAMMATORY SPONDYLOPATHIES IN DISEASES CLASSIFIED ELSEWHERE
725 POLYMYALGIA RHEUMATICA

[a]Other collagen vascular diseases not listed above may be found in the list of complications and/or comorbidities. Assign all cases with diagnoses 8200-82032 to DRG 236.

SOURCE: ProPAC Analysis.

Table B-18.—Proposed DRG 229: Hand Procedure W/O Joint Prosthesis Or Collagen Vascular Disease Or Complications And/Or Comorbidities

Operating Room Procedures

0443 CARPAL TUNNEL RELEASE
7704 METACARP/CARP SEQUESTREC
7714 OTH METACARP/CARP INCIS
7724 METACAR/CAR WEDG OSTEOTO
7734 METACAR/CAR DIVISION NEC
7744 METACARPAL/CARPAL BIOPSY
7764 LOC EXC LES METACAR/CAR
7774 EXCIS METACAR/CAR-GRAFT
7784 PART OSTECT-METACAR/CAR
7794 TOT OSTECT-METACARP/CARP
7804 BONE GRFT TO METACAR/CAR
7834 CARPAL LENGTH CHANGE
7844 OTHER METACAR/CAR REPAIR
7854 INT FIXATION-METACAR/CAR
7874 OSTEOCLASIS-METACAR/CAR
7884 OTH DX PROC-METACAR/CAR
7894 OTHER OPS ON METACAR/CAR
7913 CL RED-INT FIX METAC/CAR
7914 CLOSE RED-INT FIX FINGER
7923 OPEN REDUC-METAC/CAR FX
7924 OPEN REDUCTION-FINGER FX
7933 OP RED-INT FIX METAC/CAR
7934 OPEN RED-INT FIX FINGER
7963 DEBRID OPN FX-METAC/CAR
7964 DEBRID OPN FX-FINGER
7983 OPEN REDUC-WRIST DISLOC
7984 OPN REDUC DISLOC-HAND
7993 METACARP/CARP INJ OP NOS
7994 FINGER INJURY OP NOS
8013 OTH ARTHROTOMY-WRIST
8014 OTH ARTHROTOMY-HAND/FNGR
8043 WRIST STRUCTURE DIVISION
8044 HAND JOINT STRUCT DIVIS
8073 WRIST SYNOVECTOMY
8074 HAND SYNOVECTOMY
8083 DESTRUC-WRIST LESION NEC
8084 DESTRUC-HAND JT LES NEC
8093 EXCISION OF WRIST NEC
8094 EXCISION HAND JOINT NEC
8125 CARPORADIAL FUSION
8126 METACARPOCARPAL FUSION
8127 METACARPOPHALANGEAL FUS
8128 INTERPHALANGEAL FUSION
8179 HAND ARTHROPLASTY NEC
8187 WRIST ARTHROPLASTY NEC
8201 EXPLOR TEND SHEATH-HAND
8202 MYOTOMY OF HAND
8203 BURSOTOMY OF HAND
8209 INC SOFT TISSUE HAND NEC
8211 TENOTOMY OF HAND
8212 FASCIOTOMY OF HAND
8219 DIV SOFT TISSUE HAND NEC
8221 EXC LES TEND SHEATH HAND
8222 EXCISION HAND MUSCLE LES
8229 EXC LES SFT TISS HND NEC
8231 BURSECTOMY OF HAND
8232 EXCIS HAND TEND FOR GRFT
8233 HAND TENONECTOMY NEC
8234 EXC HND MUS/FAS FOR GRFT
8235 HAND FASCIECTOMY NEC
8236 OTHER MYECTOMY OF HAND
8239 HAND SOFT TISSUE EXC NEC
8241 SUTURE TENDN SHEATH HAND
8242 DELAY SUT FLEX TEND HAND
8243 DELAY SUT HAND TEND NEC
8244 SUTUR FLEX TEND HAND NEC
8245 SUTURE HAND TENDON NEC
8246 SUTURE HAND MUSCLE/FASC
8251 HAND TENDON ADVANCEMENT
8252 HAND TENDON RECESSION
8253 HAND TENDON REATTACHMENT
8254 HAND MUSCLE REATTACHMENT
8255 CHNG HND MUS/TEN LNG NEC
8256 TRANSPLANT HAND TEND NEC
8257 TRANSPOSIT HAND TEND NEC
8258 TRANSPLANT HAND MUSC NEC
8259 TRANSPOSIT HAND MUSC NEC
8261 POLLICIZATION OPERATION
8269 THUMB RECONSTRUCTION NEC
8271 HAND TEND PULLEY RECONST
8272 PLAST OP HND-MUS/FAS GRF
8279 PLAST OP HAND W GRFT NEC
8281 TRANSFER OF FINGER
8282 REPAIR OF CLEFT HAND
8283 REPAIR OF MACRODACTYLY
8284 REPAIR OF MALLET FINGER
8285 OTHER TENODESIS OF HAND
8286 OTHER TENOPLASTY OF HAND
8289 HAND PLASTIC OP NEC
8291 LYSIS OF HAND ADHESIONS
8299 HAND MUS/TEN/FAS/OPS NEC
8401 FINGER AMPUTATION
8402 THUMB AMPUTATION
8422 FINGER REATTACHMENT
8661 FULL-THICK HAND SKIN GRF
8662 HAND SKIN GRAFT NEC
8673 ATTACH PEDICLE TO HAND
8685 SYNDACTYLY CORRECTION

Assign all cases with diagnoses 8200-82032 to DRG 236.

SOURCE: ProPAC Analysis.

LYMPHOMAS, LEUKEMIA, AND CHEMOTHERAPY

Introduction

A number of groups have asked ProPAC to examine PPS payments for patients with lymphomas or leukemias, and for those receiving chemotherapy. The issues brought to the Commission's attention include:

- *Heterogeneity Within DRGs*—Cases grouped in DRGs 400-404 (lymphomas and leukemias) and DRG 410 (chemotherapy) are said to vary widely in terms of resource consumption.
- *Distribution of Cases Across Hospitals*—Certain institutions may treat a disproportionate share of patients with advanced stages of malignancy and, therefore, may not be adequately paid under PPS.
- *Changing Practice Patterns*—Average costs for some patients in DRGs 400-404 and 410 may be markedly greater than payments because of changes in the treatment of cancer in the elderly since 1981.
- *Cancer Research*—The costs of treating patients on clinical trial protocols may be significantly greater than the costs for similar patients not on clinical protocols.
- *Exemptions for Cancer Centers*—Although Congress gave the Secretary the authority to grant exemptions to certain hospitals, some groups believe that the Secretary has been too restrictive in granting them to cancer hospitals.

Table B-19 lists the current DRGs and their fiscal year 1986 relative weights.

Heterogeneity Within DRGs

ProPAC's work has thus far centered largely on concerns that lymphoma, leukemia, and related cases may comprise a particularly heterogeneous group. Cases in these DRGs are said to vary widely in terms of prognosis, severity of illness, and use of hospital resources. To study this heterogeneity, coefficients of variation were computed for each DRG from 1984 PATBILL file data, and outlier statistics were reviewed.

Table B-19.—Current Groupings For Lymphoma/Leukemia And Chemotherapy DRGs

	% Of Cases	1986 Relative Weight
Lymphoma/Leukemia DRGs:		
400 Lymphoma/Leukemia With Major Operating Room Procedure	8	2.6646
401 Lymphoma/Leukemia With Other Operating Room Procedure, Age >69 And/Or C.C.	12	1.5902
402 Lymphoma/Leukemia With Other Operating Room Procedure, Age <70 And No C.C.	3	1.0555
403 Lymphoma/Leukemia, Age >69 And/Or C.C.	65	1.3279
404 Lymphoma/Leukemia, Age 18-69 And No C.C.	12	1.0449
Chemotherapy DRG:		
410 Chemotherapy	100	0.4285

SOURCE: Fiscal Year 1984 PATBILL data.

Coefficients of variation for the lymphoma/leukemia DRGs were 140 percent for DRG 403 and 180 percent for DRG 404, substantially higher than for DRG 410 (Chemotherapy) or the average for other medical DRGs (109 percent and 96 percent respectively).[18] The percentage of cost and day outliers is between 6 and 15 percent for the lymphoma/leukemia DRGs and 3 percent for DRG 410 (Chemotherapy). Overall, the lymphoma/leukemia DRGs are very heterogeneous and include high numbers of outlier cases.

Intensive analysis focused on devising new DRG categories that would result in more homogeneous grouping of lymphoma, leukemia, and related cases. Diagnosis, procedure, age, and complication/comorbidity codes were studied in depth using multivariate techniques. The Commission believes the following groups should be used in place of the current DRGs:

DRG 400 Lymphoma/leukemia with major operating room procedure;
DRG 401 Acute leukemia[19] without major operating room procedure;
DRG 402 Lymphoma/non-acute leukemia with other operating room procedure and complication/comorbidity;
DRG 403 Lymphoma/non-acute leukemia with other operating room procedure or complication/comorbidity; and
DRG 404 Lymphoma/non-acute leukemia without operating room procedure or complication/comorbidity.

[18]Cost and length of stay outliers as defined by HCFA are included.
[19]"Acute Leukemia" is comprised of ICD-9-CM codes 204.0, 205.0, 206.0 or 207.0.

Mean standardized charges and length of stay outliers under the existing and new proposed DRGs are compared below.

	Present DRGs		Proposed Groupings	
DRG	n	Mean std chg	n	Mean std chg
400	6,283	$10,438	6,283	$10,438
401	9,765	$6,219	8,436	$8,966
402	2,369	$4,137	4,762	$7,593
403	53,931	$5,139	35,129	$5,031
404	9,762	$4,307	27,500	$3,680
Variation Explained (%)		3.6		7.3

The new grouping categorizes most cases involving acute leukemia into a discrete DRG, as has been recommended by cancer specialists and administrators. Further, it results in payments that more closely reflect costs of care for those cases than under the existing DRGs; the new grouping increases the amount of variation in charges explained from 3.6 percent to 7.3 percent. It also results in a relatively homogeneous distribution of cases across hospital types.

Distribution of Cases Across Hospitals

High cost variability could place individual hospitals at increased risk of a substantial loss if they have a small volume or an unusual mix of cases. In order to study this problem, case distribution for hospitals was analyzed under the proposed DRGs according to bed number and urban or rural location (Table B-20).

Small hospitals and rural hospitals see a slightly lower proportion of cases in the DRG for cases involving major operating room procedures (DRG 400—Table B-20) but a greater percentage of acute leukemia cases. The new proposed groups result in higher payments for this latter group than under the existing system. Overall, the results of Table B-20 do not suggest any major distortions of case distribution among hospitals of these differing types.

Changing Practice Patterns

ProPAC shares hospital concerns that practice pattern changes may result in rapidly changing average costs. With this in mind, the Commission has recommended that all DRG weights be recalibrated annually (see Recommendation 14). Results of recalibration for fiscal year 1986 are shown in Table B-21. The only potential change not reflected in the recalibrated weights would be that resulting from shifting of hospital cases to outpatient settings. The latter would be important only if the shift results in increased average resource consumption by the remaining patients.

Table B-20.—DRG Percentage Distribution By Hospital Type Under Proposed DRG Classification[a]

Hospital Type/Bedsize	New DRGs 400	401	402	403	404	No. Cases
Urban:						
0-99	5.75	12.99	4.88	44.84	31.54	1,947
100-404	7.73	8.62	5.87	43.28	34.50	29,020
405-684	7.69	9.07	5.50	42.77	34.96	18,786
>684	7.88	9.25	5.07	40.08	37.72	8,301
Rural:						
0-99	4.09	11.70	3.77	46.88	33.56	5,113
100-169	6.72	10.44	5.42	47.46	29.96	3,228
>169	6.75	9.15	5.94	44.40	33.76	4,446
No. Cases	5,180	6,568	3,886	30,699	24,508	70,841

[a]Inlier cases only.

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-21.—Comparison Of FY1985 Weights With FY1986 Weights Following Recalibration, Current DRGs

DRG	FY1985 Weight	FY1986 Weight	Percent Change
400	2.7978	2.6646	−4.8
401	1.2280	1.5902	29.5
402	1.1198	1.0555	−5.7
403	1.1593	1.3279	14.5
404	1.1665	1.0449	−10.4
410	0.3490	0.4285	22.8

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Cancer Research

Many clinicians and researchers have claimed that the costs of caring for patients enrolled in controlled clinical trials may be significantly higher than the costs for similar patients not in clinical trials. A major study, the Hospital Cost and Clinical Research Project, is currently in progress. Further consideration of the potential implications for the Medicare PPS will follow review of its results.

Exemptions for Cancer Centers

In the Social Security Act of 1983, Congress gave the Secretary the authority to grant exemptions to certain hospitals. That legislation states:

> The Secretary shall provide by regulation for such other exemptions and adjustments to such payment amounts under this subsection as the Secretary deems appropriate (including exemptions and adjustments that may be appropriate with respect to hospitals involved extensively in treatment for and research on cancer).

The regulations issued by the Secretary in response to the law limit exemptions only to a hospital that can demonstrate:

1. that it is recognized as a comprehensive cancer center or clinical cancer research center by the National Cancer Institute as of April 20, 1983;
2. that the entire facility is organized primarily for treatment of and research on cancer; and
3. that at least 50 percent of its total discharges reflect a principal diagnosis of neoplastic disease.

Thus far, only six hospitals have received exemptions. ProPAC will consider this issue once work is completed concerning cost heterogeneity and the results of the Hospital Cost and Clinical Research Project are obtained.

Summary

DRGs involving lymphoma, leukemia, and other related cases have been found to be notably more heterogeneous than most other DRGs. New DRG groups are recommended that would result in payments that are more closely related to costs, including the creation of a discrete DRG for acute leukemia cases (not involving major surgery). The groups result in a fairly homogeneous distribution of cases among hospitals. The Commission will continue to consider other ways of further improving payment for these DRGs.

Changes in costs associated with practice pattern changes have been and should continue to be dealt with by recalibration of DRG weights on an annual basis (see Recommendation 14). The Commission will await results of the Hospital Cost and Clinical Research Project before further considering costs of patients on clinical trial protocols and cancer center exemptions.

Recommendation

Prior to recalibration, cases currently assigned to DRGs involving lymphoma, leukemia, and other related diagnoses (DRGs 400-404) should be reclassified into one of five newly defined DRGs. The new classification should provide a unique DRG for acute leukemia cases not involving a major operative procedure, eliminate age as a criterion for DRG assignment, and modify present classification based on operative procedure, complications and comorbidity. Other ways of further improving these DRGs should continue to be explored.

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BURN DRGs

ProPAC examined PPS payments for burn patients. Burn severity varies considerably depending on the size of the area burned, the degree of the burn, and the part of the body burned. As currently defined, the burn DRGs (457-460) are very heterogenous in terms of resource consumption.

Resource consumption also differs according to type of hospital. Burn patients treated at burn centers use more resources and also have a higher mortality rate than burn patients treated at other hospitals (Tables B-25 through B-28). The National Coalition of Burn Center Hospitals have stated that two percent of hospitals in the U.S. have burn centers and treat 20 percent of the burn cases. Burn centers also treat a high percentage of outlier cases (Table B-22).

Transfer policy regarding DRG 456 (burns transferred to another acute care facility) states that the transferring hospital is paid the full DRG payment amount and any applicable outlier payments. Hospitals that admit a patient for one or two days and then transfer the patient to a burn center may be overpaid under DRG 456. Burn centers may be underpaid if a patient is treated and then transferred to a community hospital when medically appropriate. This DRG involves only 145 Medicare beneficiaries.

ProPAC Analysis

As currently defined, the burn DRGs (457 to 460) are extremely heterogenous and together explain approximately 9 percent of the variance in hospital charges for burn cases in the 1984 PATBILL. (Table B-23) Three potential mechanisms for making PPS payments in these DRGs more appropriate are:

Reclassification Based on Patient Characteristics

A number of alternative groupings of burn cases were studied using combinations of selected principal diagnoses, specific secondary diagnoses, and whether or not a patient survived the hospitalization. The classification explaining the most variance is summarized in Table B-24.[20] Although these proposed DRGs increase the explained variance to about 17 percent (R^2 of .17 compared to .09), all cases resulting in death are classified into the category "burns, expired." The best alternative reclassification without using the death variable explains only 12 percent of the variance in charges.

[20]Proposed classifications for the burn DRGs considered by the Commission are presented in Tables B-29 through B-32.

Table B-22.—Admissions, Percent Outliers And Mean Charges For Burn Centers And All Other Hospitals, Current DRGs

DRGs	Discharges	Percent Outliers	Mean Inlier Charges	Mean Total Charges
457				
Burn Centers	223	53	5,879	33,487
All Other Hospitals	129	39	5,883	20,738
458				
Burn Centers	487	44	8,733	28,250
All Other Hospitals	1,206	24	6,430	10,704
459				
Burn Centers	109	55	7,719	37,985
All Other Hospitals	682	19	4,855	8,319
460				
Burn Centers	498	22	4,960	13,180
All Other Hospitals	3,405	8	3,259	3,914

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-23.—Admissions, Mean Charges, Percent Outliers And Variance Explained By The Current DRGs

Current DRG Groupings	N	Mean Charges	Percent Outliers (LOS)	R^2
Extensive Burns	352	28,814	48	0.09
Non-Extensive Burns With Skin Graft	1,693	15,760	29	
Non-Extensive Burns With Wound Debridement	791	12,422	23	
Non-Extensive Burns Without OR Procedure	3,903	5,100	9	

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-24.—Admissions, Mean Charges, Percent Outliers And Variance Explained By The Alternative DRGs

Current DRG Groupings	N	Mean Charges	Percent Outliers (LOS)	R^2
Burns, Expired	560	31,956	26	0.17
Extensive Burns, Not Expired	212	30,161	37	
Non-Extensive Burns With Skin Graft, Wound Debridement, Other OR Procedure, Not Expired	2,271	11,693	22	
Non-Extensive Burns Without OR Procedure, Not Expired	3,706	4,272	8	

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Reclassification Based on Hospital Characteristics

Since burn center cases have significantly higher charges than discharges in other hospitals, alternative DRG groupings were tested based on the site of care. If the current 4 burn DRGs were each split into separate DRGs for burn centers and non-burn centers respectively (analagous to creating separate weights for burn centers and non-burn centers), the new classification increases the explained variance to about 18 percent, or roughly double the value for current DRGs. Similarly, if each of the groups in the best alternative classification (without using death) described above was also split on site of care, the explained variance would increase from about 12 to 20 percent.

Modifications To Outlier Payments

As shown in Table B-22, burn centers and non-burn centers both have many outlier cases in the burn DRGs. While outlier cases comprise about 3.35 percent of all Medicare discharges, they constitute 38 percent of cases in the burn DRGs at burn centers and 13 percent of burn cases at other hospitals. Reclassifying the burn DRGs based on patient characteristics would reduce the percentage of outlier cases at burn center to 26 percent. Although the percentage of outliers for all other hospitals treating burn patients would remain constant, the total percentage of outliers for all burn patients would decrease from 18 percent to 15 percent. Although further analysis will be necessary to determine the appropriateness of current outlier payments for those cases, changes in outlier policy could have a significant effect on cases in the burn DRGs.

Conclusions

- The current burn DRGs are extremely heterogeneous.
  1. Reclassifying the DRGs using patient characteristics including death increases the percent of explained variance in charges from 9 percent to 17 percent.

2. Alternative reclassification without using death provides only marginal improvement in the percent of explained variance.
3. Creating separate weights for burn centers and non-burn centers will double the variance explained by the burn DRGs, but will pay hospitals according to type of institution and not the characteristics of the patient or type of care provided.

- Data from the 1984 PATBILL file show that burn centers treat the more resource intensive burn patients and burn centers are probably underpaid for treating these patients. This generic problem of a specialty hospital treating the more severe patients exists for many other DRGs also.
- Burn centers and non-burn centers treat a high percentage of outlier cases in the burn DRGs, although burn centers treat a higher percentage than non-burn centers. Further analysis is needed to determine the appropriateness of payments for these cases in burn centers and other hospitals.
  1. The proposed DRG classification based on patient characteristics, including death, reduced the total percentage of outliers for burn cases from 18 percent to 15 percent.
     —38 percent to 26 percent for burn centers.
     —Non-burn centers remained at 13 percent.
  2. Under the proposed DRGs, the percent of burn cases paid as outliers is still likely to be markedly higher than for other kinds of cases. About 3.35 percent of all Medicare discharges are paid as outliers.
- While payments for DRG 456 might be too high for some hospitals and too low for others, the problem might be of a lesser concern to the Commission since there are only 145 cases in DRG 456.

Commission Action

The Commission considered several alternative classifications for the burn DRGs. Although these reclassifications decreased the heterogeneity of the burn DRGs, their effect on total payments to hospitals was unclear. The Commission consulted with the National Coalition of Burn Center Hospitals who believed that burn center hospitals may be adversely impacted by the proposed burn DRGs. The Commission therefore decided not to recommend reclassification of the burn DRGs, but to continue analysis with regard to outlier policy and case-mix distribution among specialty hospitals.

Table B-25.—DRG 457—Extensive Burns

	Burn Centers		All Other Hospitals	
Mean Charges, Burn Patients				
Mean Charges	33,487		20,738	
Number Of Patients	223		129	
Mean Length Of Stay (Days) Of Burn Patients				
Mean Length Of Stay	20.9		23.9	
Number Of Patients	223.0		129.0	
Burn Patients By Discharge Status				
Discharge Status:				
Alive	57	(25.6%)	79	(61.2%)
Dead	166	(74.4%)	50	(38.8%)
Total	223	(100%)	129	(100%)
Burn Patients By Inlier/Outlier (LOS And Cost) Status				
Inliers:				
N	105		79	
%	47		61	
Outliers:				
N	118		50	
%	53		39	
Total:				
N	223		129	
%	100		100	

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-26.—DRG 458—Non-Extensive Burns With Grafts

	Burn Centers		All Other Hospitals	
Mean Charges, Burn Patients				
Mean Charges	28,250		10,703	
Number Of Patients	487		1,206	
Mean Length Of Stay (Days) Of Burn Patients				
Mean Length Of Stay	30.2		24.5	
Number Of Patients	487.0		1,206.0	
Burn Patients By Discharge Status				
Discharge Status:				
Alive	428	(88.4%)	1,185	(98.3%)
Dead	59	(11.6%)	21	(1.7%)
Total	487	(100%)	1,206	(100%)
Burn Patients By Inlier/Outlier (LOS And Cost) Status[a]				
Inliers:				
N	272		922	
%	56		76	
Outliers:				
N	215		281	
%	44		24	
Total:				
N	487		1,203	
%	100		100	

[a]Three cases were excluded from this analysis due to missing values for relevant characteristics.

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-27.—DRG 459—Non-Extensive Burns With Wound Debridements

	Burn Centers		All Other Hospitals	
Mean Charges, Burn Patients				
Mean Charges	37,985		8,318	
Number Of Patients	109		682	
Mean Length Of Stay (Days) Of Burn Patients				
Mean Length Of Stay	32.8		18.8	
Number Of Patients	109.0		682.0	
Burn Patients By Discharge Status				
Discharge Status:				
Alive	75	(68.8%)	647	(94.9%)
Dead	34	(31.2%)	35	(5.1%)
Total	109	(100%)	682	(100%)
Burn Patients By Inlier/Outlier (LOS And Cost) Status[a]				
Inliers:				
N	49		554	
%	45		81	
Outliers:				
N	60		126	
%	55		19	
Total:				
N	109		679	
%	100		100	

[a]Three cases were excluded from this analysis due to missing values for relevant characteristics.

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-28.—DRG 460—Non-Extensive Burns Without OR Procedures

	Burn Centers		All Other Hospitals	
Mean Charges, Burn Patients				
Mean Charges	13,180		3,914	
Number Of Patients	498		3,405	
Mean Length Of Stay (Days) Of Burn Patients				
Mean Length Of Stay	16.0		11.2	
Number Of Patients	498.0		3,405.0	
Burn Patients By Discharge Status				
Discharge Status:				
Alive	388	(79.5%)	3,315	(97.5%)
Dead	110	(20.5%)	90	(2.5%)
Total	498	(100%)	3,405	(100%)
Burn Patients By Inlier/Outlier (LOS And Cost) Status[a]				
Inliers:				
N	390		3,138	
%	78		92	
Outliers:				
N	108		254	
%	22		8	
Total:				
N	498		3,392	
%	100		100	

[a]Three cases were excluded from this analysis due to missing values for relevant characteristics.

SOURCE: Fiscal Year 1984 PATBILL and Provider Specific Files.

Table B-29.—Alternative DRG For Burns, Expired

Expired All Burn Cases Discharged Dead

Table B-30.—Alternative DRG For Extensive Burns

Any Diagnosis	
94800	BDY BRN < 10%/3D DEG NOS[a]
94810	10-19% BDY BRN/3 DEG NOS[a]
94811	10-19% BDY BRN/10-19% 3D[a]
94820	20-29% BDY BRN/3 DEG NOS[a]
94821	20-29% BDY BRN/10-19% 3D[a]
94822	20-29% BDY BRN/20-29% 3D
94830	30-39% BDY BRN/3 DEG NOS[a]
94831	30-39% BDY BRN/10-19% 3D[a]
94832	30-39% BDY BRN/20-29% 3D
94833	30-39% BDY BRN/30-39% 3D
94840	40-49% BDY BRN/3 DEG NOS[a]
94841	40-49% BDY BRN/10-19% 3D[a]
94842	40-49% BDY BRN/20-29% 3D
94843	40-49% BDY BRN/30-39% 3D
94844	40-49% BDY BRN/40-49% 3D
94850	50-59% BDY BRN/3 DEG NOS
94851	50-59% BDY BRN/10-19% 3D
94852	50-59% BDY BRN/20-29% 3D
94853	50-59% BDY BRN/30-39% 3D
94854	50-59% BDY BRN/40-49% 3D
94855	50-59% BDY BRN/50-59% 3D
94860	60-69% BDY BRN/3 DEG NOS
94861	60-69% BDY BRN/10-19% 3D
94862	60-69% BDY BRN/20-29% 3D
94863	60-69% BDY BRN/30-39% 3D
94864	60-69% BDY BRN/40-49% 3D
94865	60-69% BDY BRN/50-59% 3D
94866	60-69% BDY BRN/60-69% 3D
94870	70-79% BDY BRN/3 DEG NOS
94871	70-79% BDY BRN/10-19% 3D
94872	70-79% BDY BRN/20-29% 3D
94873	70-79% BDY BRN/30-39% 3D
94874	70-79% BDY BRN/40-49% 3D
94875	70-79% BDY BRN/50-59% 3D
94876	70-79% BDY BRN/60-69% 3D
94877	70-79% BDY BRN/70-79% 3D
94880	80-89% BDY BRN/3 DEG NOS
94881	80-89% BDy BRN/10-19% 3D
94882	80-89% BDY BRN/20-29% 3D
94883	80-89% BDY BRN/30-39% 3D
94884	80-89% BDY BRN/40-49% 3D
94885	80-89% BDY BRN/50-59% 3D
94886	80-89% BDY BRN/60-69% 3D
94887	80-89% BDY BRN/70-79% 3D
94888	80-89% BDY BRN/80-89% 3D
94890	90% + BDY BRN/3D DEG NOS
94891	90% + BDY BRN/10-19% 3RD
94892	90% + BDY BRN/20-29% 3RD
94893	90% + BDY BRN/30-39% 3RD
94894	90% + BDY BRN/40-49% 3RD
94895	90% + BDY BRN/50-59% 3RD
94896	90% + BDY BRN/60-69% 3RD
94897	90% + BDY BRN/70-79% 3RD
94898	90% + BDY BRN/80-89% 3RD
94899	90% + BDY BRN/90% + 3RD
9490	BURN NOS
9493	3RD DEGREE BURN NOS[a]
9494	DEEP 3RD DEG BURN NOS[a]
9495	3RD BURN W LOSS-SITE NOS[a]

[a]Only classified into the Extensive Burn DRG if patient also undergoes skin graft, wound debridement, or other OR procedure.

SOURCE: ProPAC analysis.

Table B-31.—Alternative DRG For Non-Extensive Burns With Skin Graft, Wound Debridement Or Other Operating Room Procedure

Principal Diagnosis

941DD BURN NOS HEAD-UNSPEC
941D1 BURN NOS EAR
941D3 BURN NOS LIP
941D4 BURN NOS CHIN
941D5 BURN NOS NDSE
941D6 BURN NDS SCALP
94107 BURN NDS FACE NEC
941D8 BURN NOS NECK
941D9 BURN NDS HEAD-MULT
9411D 1ST DEG BURN HEAD NOS
94111 1ST DEG BURN EAR
94113 1ST DEG BURN LIP
94114 1ST DEG BURN CHIN
94115 1ST OEG BURN NDSE
94116 1ST OEG BURN SCALP
94117 1ST DEG BURN FACE NEC
94118 1ST DEG BURN NECK
94119 1ST DEG BURN HEAD-MULT
9412D 2ND DEG BURN HEAD NDS
94121 2ND OEG BURN EAR
94123 2ND DEG BURN LIP
94124 2ND DEG BURN CHIN
94125 2ND OEG BURN NOSE
94126 2ND DEG BURN SCALP
94127 2ND DEG BURN FACE NEC
94128 2ND DEG BURN NECK
94129 2ND DEG BURN HEAD-MULT
94130 3RO DEG BURN HEAD NOS
94131 3RO DEG BURN EAR
94133 3RD OEG BURN LIP
94134 3RD OEG BURN CHIN
94135 3RD OEG BURN NOSE
94136 3RD DEG BURN SCALP
94137 3RD DEG BURN FACE NEC
94138 3RO DEG BURN NECK
94139 3RD DEG BURN HEAD-MULT
9414D DEEP 3 DEG BURN HEAO NOS
94141 DEEP 3RD DEG BURN EAR
94143 DEEP 3RO DEG BURN LIP
94144 DEEP 3RD DEG BURN CHIN
94145 OEEP 3RD DEG BURN NDSE
94146 DEEP 3RD DEG BURN SCALP
94147 DEEP 3RD BURN FACE NEC
94148 DEEP 3RD DEG BURN NECK
94149 DEEP 3 OEG BRN HEAD-MULT
9415D 3RD BURN W LOSS-HEAD NDS
94151 3RD OEG BURN W LOSS-EAR
94153 3RO DEG BURN W LOSS-LIP
94154 3RD DEG BURN W LOSS-CHIN
94155 3RD DEG BURN W LOSS-NOSE
94156 3RD DEG BURN W LOSS-SCALP
94157 3RD BURN W LOSS-FACE NEC
94158 3RD DEG BURN W LOSS-NECK
94159 3RD BRN W LOSS-HEAD MULT
942DD BURN NOS TRUNK-UNSPEC
942D1 BURN NDS BREAST
942D2 BURN NOS CHEST WALL
942D3 BURN NOS ABDDMINAL WALL
942D4 BURN NOS BACK
942D5 BURN NDS GENITALIA
942D9 BURN NDS TRUNK NEC
9421D 1ST DEG BURN TRUNK NOS
94211 1ST DEG BURN BREAST
94212 1ST DEG BURN CHEST WALL
94213 1ST DEG BURN ABDOMN WALL
94214 1ST DEG BURN BACK
94215 1ST DEG BURN GENITALIA
94219 1ST DEG BURN TRUNK NEC
9422D 2ND DEG BURN TRUNK NOS
94221 2ND DEG BURN BREAST
94222 2ND DEG BURN CHEST WALL
94223 2ND DEG BURN ABDOMN WALL
94224 2ND DEG BURN BACK
94225 2ND OEG BURN GENITALIA
94229 2ND DEG BURN TRUNK NEC
9423D 3RD DEG BURN TRUNK NOS
94231 3RD DEG BURN BREAST
94232 3RD DEG BURN CHEST WALL
94233 3RD DEG BURN ABDOMN WALL
94234 3RD DEG BURN BACK
94235 3RD DEG BURN GENITALIA
94239 3RD DEG BURN TRUNK NEC
9424D DEEP 3RD BURN TRUNK NOS
94241 DEEP 3RO DEG BURN BREAST
94242 DEEP 3RD BURN CHEST WALL
94243 DEEP 3RD BURN ABDOM WALL
94244 DEEP 3RD DEG BURN BACK
94245 DEEP 3RD BURN GENITALIA
94249 DEEP 3RD BURN TRUNK NEC
9425D 3RD BRN W LDSS-TRUNK NOS
94251 3RD BURN W LOSS-BREAST
94252 3RD BRN W LOSS-CHEST WLL
94253 3RD BRN W LOSS-ABDOM WLL
94254 3RD DEG BURN W LDSS-BACK
94255 3RD BRN W LOSS-GENITALIA
94259 3RD BRN W LOSS-TRUNK NEC
943DD BURN NOS ARM-UNSPEC
94301 BURN NOS FDREARM
94302 BURN NOS ELBOW
943D3 BURN NOS UPPER ARM
943D4 BURN NDS AXILLA
943D5 BURN NDS SHOULDER
943D6 BURN NOS SCAPULA
943D9 BURN NDS ARM-MULTIPLE
9431D 1ST DEG BURN ARM NOS
94311 1ST DEG BURN FOREARM
94312 1ST DEG BURN ELBOW
94313 1ST DEG BURN UPPER ARM
94314 1ST DEG BURN AXILLA
94315 1ST DEG BURN SHDULDER
94316 1ST DEG BURN SCAPULA
94319 1ST DEG BURN ARM-MULT
9432D 2ND DEG BURN ARM NDS
94321 2ND DEG BURN FDREARM
94322 2ND DEG BURN ELBOW
94323 2ND DEG BURN UPPER ARM
94324 2ND DEG BURN AXILLA
94325 2ND DEG BURN SHOULDER
94326 2ND DEG BURN SCAPULA
94329 2ND DEG BURN ARM-MULT
9433D 3RD DEG BURN ARM NOS
94331 3RD DEG BURN FDREARM
94332 3RD DEG BURN ELBOW
94333 3RD DEG BURN UPPER ARM
94334 3RD DEG BURN AXILLA
94335 3RD DEG BURN SHDULDER
94336 3RD DEG BURN SCAPULA
94339 3RD DEG BURN ARM-MULT
9434D DEEP 3 DEG BURN ARM NOS
94341 DEEP 3 DEG BURN FDREARM
94342 DEEP 3 DEG BURN ELBOW
94343 DEEP 3 DEG BRN UPPER ARM
94344 DEEP 3 DEG BURN AXILLA
94345 DEEP 3 DEG BURN SHDULDER
94346 DEEP 3 DEG BURN SCAPULA
94349 DEEP 3 DEG BURN ARM-MULT
9435D 3RD BURN W LDSS-ARM NOS
94351 3RD BURN W LDSS-FDREARM
94352 3RD BURN W LOSS-ELBDW
94353 3RD BRN W LOSS-UPPER ARM
94354 3RD BURN W LOSS-AXILLA
94355 3RD BURN W LDSS-SHOULDER
94356 3RD BURN W LOSS-SCAPULA
94359 3RD BURN W LOSS ARM-MULT
9440D BURN NOS HAND-UNSPEC
944D1 BURN NOS FINGER
944D2 BURN NOS THUMB
944D3 BURN NDS MULT FINGERS
944D4 BURN NDS FINGER W THUMB
944D5 BURN NOS PALM
944D6 BURN NOS BACK OF HAND
944D7 BURN NDS WRIST
944D8 BURN NDS HAND-MULTIPLE
9441D 1ST DEG BURN HANO NOS
94411 1ST DEG BURN FINGER
94412 1ST DEG BURN THUMB
94413 1ST DEG BURN MULT FINGER
94414 1 DEG BURN FINGR W THUMB
94415 1ST DEG BURN PALM
94416 1 DEG BURN BACK OF HAND
94417 1ST DEG BURN WRIST
94418 1ST DEG BURN HAND-MULT
9442D 2ND DEG BURN HAND NDS
94421 2ND DEG BURN FINGER
94422 2ND DEG BURN THUMB
94423 2ND DEG BURN MULT FINGER
94424 2 DEG BURN FINGR W THUMB
94425 2ND DEG BURN PALM
94426 2 DEG BURN BACK DF HAND
94427 2ND DEG BURN WRIST
94428 2ND DEG BURN HAND-MULT
9443D 3RD DEG BURN HAND NDS
94431 3RD DEG BURN FINGER
94432 3RD DEG BURN THUMB
94433 3RD DEG BURN MULT FINGER
94434 3 DEG BURN FINGR W THUMB
94435 3RD DEG BURN PALM
94436 3 DEG BURN BACK OF HAND
94437 3RD DEG BURN WRIST
94438 3RD DEG BURN HAND-MULT
9444D DEEP 3 DEG BRN HAND NOS
94441 DEEP 3 DEG BURN FINGER
94442 DEEP 3 DEG BURN THUMB
94443 DEEP 3RD BRN MULT FINGER
94444 DEEP 3RD BRN FNGR W THMB
94445 DEEP 3 DEG BURN PALM
94446 DEEP 3RD BRN BACK DF HND
94447 DEEP 3 DEG BURN WRIST

Table B-31.—DRG For Non-Extensive Burns With Skin Graft, Wound Debridement Or Other Operating Room Procedure—Continued

94448 OEEP 3 DEG BRN HAND-MULT
94450 3RD BRN W LOSS-HAND NOS
94451 3RO BURN W LOSS-FINGER
94452 3RO BURN W LOSS-THUMB
94453 3RO BRN W LOSS-MULT FNGR
94454 3RO BRN W LOSS-FNGR/THMB
94455 3RO BURN W LOSS-PALM
94456 3RD BRN W LOSS-BK OF HNO
94457 3RD BURN W LOSS-WRIST
94458 3RO BRN W LOSS HAND-MULT
94500 BURN NOS LEG-UNSPEC
94501 BURN NOS TOE
94502 BURN NOS FOOT
94503 BURN NOS ANKLE
94504 BURN NOS LOWER LEG
94505 BURN NOS KNEE
94506 BURN NOS THIGH
94509 BURN NOS LEG-MULTIPLE
94510 1ST OEG BURN LEG NOS
94511 1ST OEG BURN TOE
94512 1ST DEG BURN FOOT
94513 1ST OEG BURN ANKLE
94514 1ST OEG BURN LOWER LEG
94515 1ST DEG BURN KNEE
94516 1ST DEG BURN THIGH
94519 1ST DEG BURN LEG-MULT
94520 2NO DEG BURN LEG NOS
94521 2NO OEG BURN TOE
94522 2ND OEG BURN FOOT
94523 2NO OEG BURN ANKLE
94524 2NO OEG BURN LOWER LEG
94525 2NO DEG BURN KNEE
94526 2NO OEG BURN THIGH
94529 2NO OEG BURN LEG-MULT
94530 3RO OEG BURN LEG NOS
94531 3RD OEG BURN TOE
94532 3RO OEG BURN FOOT
94533 3RO OEG BURN ANKLE
94534 3RO OEG BURN LOW LEG
94535 3RD OEG BURN KNEE
94536 3RO DEG BURN THIGH
94539 3RO DEG BURN LEG-MULT
94540 DEEP 3RO OEG BRN LEG NOS
94541 DEEP 3RO OEG BURN TOE
94542 DEEP 3RO OEG BURN FOOT
94543 OEEP 3RO OEG BURN ANKLE
94544 OEEP 3RO OEG BRN LOW LEG
94545 OEEP 3RO DEG BURN KNEE
94546 DEEP 3RO OEG BURN THIGH
94549 DEEP 3 OEG BURN LEG-MULT
94550 3 DEG BRN W LOSS-LEG NOS
94551 3 DEG BURN W LOSS-TOE
94552 3 DEG BURN W LOSS-FOOT
94553 3 OEG BURN W LOSS-ANKLE
94554 3 OEG BRN W LOSS-LOW LEG
94555 3 OEG BURN W LOSS-KNEE
94556 3 OEG BURN W LOSS-THIGH
94559 3 DEG BRN W LOSS LEG-MLT
9460 BURN NOS MULTIPLE SITE
9461 1ST DEG BURN MULT SITE
9462 2ND DEG BURN MULT SITE
9463 3RD DEG BURN MULT SITE
9464 DEEP 3 OEG BRN MULT SITE
9465 3RD BRN W LOSS-MULT SITE
9478 BURN INTERNAL ORGAN NEC
9479 BURN INTERNAL ORGAN NOS

Operating Room Procedures

8582 BREAST SPLIT-THICK GRAFT
8583 BREAST FULL-THICK GRAFT
8584 BREAST PEOICLE GRAFT
8660 FREE SKIN GRAFT NOS
8661 FULL-THICK HAND SKIN GRF
8662 HANO SKIN GRAFT NEC
8663 FULL-THICK SKIN GRFT NEC
8665 HETEROGRAFT TO SKIN
8666 HOMOGRAFT TO SKIN
8669 FREE SKIN GRAFT NEC
8670 PEOICLE GRAFT/FLAP NOS
8671 CUT PREP PEOICLE GRAFT
8672 PEOICLE GRAFT AOVANCEMEN
8673 ATTACH PEOICLE TO HANO
8674 ATTACH PEOICLE GRAFT NEC
8675 REVISION OF PEDICLE GRFT
0492 IMPLANT PERIPH STIMULAT
0493 REMOVE PERIPH STIMULATOR
0820 REMOVE EYELIO LESION NOS
0822 EXCISE MINOR LES LIO NEC
0823 EXC MAJ LES LIO PRT-THIC
0824 EXC MAJ LES LIO FUL-THIC
0825 DESTRUCTION LID LESION
0838 CORRECT LID RETRACTION
0841 THERMOCAUT/ENTROPION REP
0843 WEOG RESEC ENTROPION REP
0849 ENTROPION/ECTROP REP NEC
0851 CANTHOTOMY
0859 AOJUST LIO POSITION NEC
0861 LIO RECONST W SKIN GRAFT
0862 LIO RECONST W MUC GRAFT
0863 LIO RECONST W HAIR GRAFT
0864 LIO RECON-TARSOCONJ FLAP
0869 LIO RECONSTR W GRAFT NEC
0870 LID RECONSTRUCTION NOS
0871 LID MARG RECON-PART THICK
0872 LID RECONS-PART THIC NEC
0873 LIO MARG RECONS FUL THIC
0874 LID RECONST-FUL THIC NEC
0882 LID MARG LAC RX-PART TH
0884 LID MARG LAC RX-FUL THIC
0889 EYELID REPAIR NEC
0899 EYELID OPERATION NEC
0971 CORRECT EVERTEO PUNCTUM
1631 EYE EVISC W SYNCH IMPLAN
1639 EYEBALL EVISCERATION NEC
1641 EYE ENUC/IMPLAN/MUSC ATT
1642 EYE ENUC W IMPLANT NEC
1649 EYEBALL ENUCLEATION NEC
1651 RADICAL ORBITOMAXILLECT
1652 ORBIT EXENT W BONE REMOV
1659 ORBITAL EXENTERATION NEC
1661 2NDRY OCULAR IMP INSERT
1662 REVIS/REINSERT OCUL IMP
1663 REVIS ENUC SOCKET W GRFT
1664 ENUC SOCKET REVIS NEC
1665 2NDRY EXENT CAVITY GRAFT
1666 REVIS EXENTER CAVITY NEC
1669 2NO OP POST EYE REM NEC
1671 REMOVE OCULAR IMPLANT
1672 REMOVE ORBITAL IMPLANT
1681 REPAIR OF ORBITAL WOUNO
1682 REPAIR EYEBALL RUPTURE
1689 EYE ORBIT INJ REPAIR NEC
1692 EXCISION ORBITAL LESION
1693 EXCISION EYE LESION NOS
1698 OPERATION ON ORBIT NEC
1699 OPERATION ON EYEBALL NEC
1839 EXCIS EXTERNAL EAR NEC
186 EXT AUOIT CANAL RECONSTR
1871 CONSTRUCTION EAR AURICLE
1872 REATTACH AMPUTATEO EAR
1879 PLASTIC REP EXT EAR NEC
189 OTHER EXT EAR OPERATIONS
214 RESECTION OF NOSE
2183 TOT NASAL RECONSTRUCTION
2184 REVISION RHINOPLASTY
2185 AUGMENTATION RHINOPLASTY
2186 LIMITEO RHINOPLASTY
2187 RHINOPLASTY NEC
2189 NASAL REPAIR NEC
2199 NASAL OPERATION NEC
2559 REPAIR OF TONGUE NEC
2749 EXCISION OF MOUTH NEC
2753 CLOSURE OF MOUTH FISTULA
2755 FULL-THICK GRFT TO MOUTH
2756 SKIN GRAFT TO MOUTH NEC
2757 PEOICLE ATTACH TO MOUTH
2759 MOUTH REPAIR NEC
3121 MEOIASTINAL TRACHEOSTOMY
3129 OTHER PERM TRACHEOSTOMY
3169 OTHER LARYNGEAL REPAIR
3172 CLOSURE OF TRACHEOSTOMY
3174 REVISION OF TRACHEOSTOMY
3175 TRACHEAL RECONSTRUCTION
3179 OTHER TRACHEAL REPAIR
3192 LYSIS TRACH/LARYNX ADHES
323 SEGMENTAL LUNG RESECTION
324 LOBECTOMY OF LUNG
325 COMPLETE PNEUMONECTOMY
329 OTHER EXCISION OF LUNG
3342 BRONCHIAL FISTULA CLOS
3348 BRONCHIAL REPAIR NEC
3349 LUNG REPAIR NEC
3451 DECORTICATION OF LUNG
3459 OTHER PLEURAL EXCISION
3473 CLOS THORACIC FISTUL NEC
3479 OTHER CHEST WALL REPAIR
3791 OPN CHEST CARDIAC MASSAG
3927 OIALYSIS ARTERIOVENOSTOM
3942 REVIS REN OIALYSIS SHUN
4209 ESOPHAGEAL INCISION NF
4210 ESOPHAGOSTOMY NOS
4211 CERVICAL ESOPHAGOS
4212 ESOPH POUCH EXTERIORIZAT
4219 EXT FISTULIZAT ESOPH NEC
4221 ESOPHAGOSCOPY BY INCIS
4240 ESOPHAGECTOMY NOS
4241 PARTIAL ESOPHAGECTOMY
4242 TOTAL ESOPHAGECTOMY
4251 THORAC ESOPHAGOESOPHAGOS
4252 THORAC ESOPHAGOGASTROST

Table B-31.—Alternative DRG For Non-Extensive Burns With Skin Graft, Wound Debridement Or Other Operating Room Procedure—Continued

4253	THORAC SM BOWEL INTERPOS	4465	ESOPHAGOGASTROPLASTY	8409	FOREQUARTER AMPUTATION
4254	THORAC ESOPHAGOENTER NEC	4469	GASTRIC REPAIR NEC	8410	LOWER LIMB AMPUTAT NOS
4255	THORAC LG BOWEL INTERPOS	4499	GASTRIC OPERATION NEC	8411	TOE AMPUTATION
4256	THORAC ESOPHAGOCOLOS NEC	5361	INCIS HERNIA REPAIR-GRFT	8412	AMPUTATION THROUGH FOOT
4258	THORAC INTERPOSITION NEC	540	ABDOMINAL WALL INCISION	8413	DISARTICULATION OF ANKLE
4259	THORAC ESOPHAG ANAST NEC	5411	EXPLORATORY LAPAROTOMY	8414	AMPUTAT THROUGH MALLEOLI
4261	STERN ESOPHAGOESOPHAGOST	5412	REOPEN RECENT LAP SITE	8415	BELOW KNEE AMPUTAT NEC
4262	STERN ESOPHAGOGASTROSTOM	5419	LAPAROTOMY NEC	8416	DISARTICULATION OF KNEE
4263	STERN SM BOWEL INTERPOS	5421	LAPAROSCOPY	8417	ABOVE KNEE AMPUTATION
4264	STERN ESOPHAGOENTER NEC	5461	RECLOSE POST OP DISRUPT	8418	DISARTICULATION OF HIP
4265	STERN LG BOWEL INTERPOS	5462	DELAYED CLOS ABD WOUND	8419	HINDQUARTER AMPUTATION
4266	STERN ESOPHAGOCOLOS NEC	5463	ABD WALL SUTURE NEC	8421	THUMB REATTACHMENT
4268	STERN INTERPOSITION NEC	623	UNILATERAL ORCHIECTOMY	8422	FINGER REATTACHMENT
4269	STERN ESOPHAG ANAST NEC	6241	REMOVE BOTH TESTES	8423	FOREARM/WRIST/HAND REATT
4283	ESOPHAGOSTOMY CLOSURE	6242	REMOVE SOLITARY TESTIS	8424	UPPER ARM REATTACHMENT
4284	ESOPH FISTULA REPAIR NEC	6269	TESTICULAR REPAIR NEC	8425	TOE REATTACHMENT
4285	ESOPHAG STRICTURE REPAIR	6299	TESTICULAR OPERATION NEC	8426	FOOT REATTACHMENT
4286	PROD SUBQ TUNNEL NO ANAS	643	AMPUTATION OF PENIS	8427	LOWER LEG/ANKLE REATTACH
4287	ESOPHAGEAL GRAFT NEC	6443	CONSTRUCTION OF PENIS	8428	THIGH REATTACHMENT
4289	ESOPHAGEAL REPAIR NEC	6444	RECONSTRUCTION OF PENIS	8429	REATTACHMENT NEC
430	GASTROTOMY	6445	REPLANTATION OF PENIS	843	AMPUTATION STUMP REVIS
435	PROXIMAL GASTRECTOMY	6449	PENILE REPAIR NEC	8440	IMPLNT/FIT PROS LIMB NOS
436	DISTAL GASTRECTOMY	8400	UPPER LIMB AMPUTAT NOS	8444	IMPLANT ARM PROSTHESIS
437	PART GASTREC W JEJ ANAST	8401	FINGER AMPUTATION	8448	IMPLANT LEG PROSTHESIS
4381	PART GAST W JEJ TRANSPOS	8402	THUMB AMPUTATION	8491	AMPUTATION NOS
4389	PARTIAL GASTRECTOMY NEC	8403	AMPUTATION THROUGH HAND	8622	WOUND DEBRIDEMENT
4391	TOT GAST W INTES INTERPO	8404	DISARTICULATION OF WRIST	864	RADICAL EXCIS SKIN LES
4399	TOTAL GASTRECTOMY NEC	8405	AMPUTATION THRU FOREARM	8684	RELAXATION OF SCAR
4411	TRANSABDOMIN GASTROSCOPY	8406	DISARTICULATION OF ELBOW	8689	SKIN REPAIR PLASTY NEC
445	REVISION GASTRIC ANASTOM	8407	AMPUTATION THRU HUMERUS	8691	SKIN EXCISION FOR GRAFT
4463	CLOSE GASTRIC FISTUL NEC	8408	SHOULDER DISARTICULATION		

SOURCE: ProPAC analysis.

Table B-32.—Alternative DRG For Non-Extensive Burns Without Operating Room Procedure

Principal Diagnosis

94100 BURN NOS HEAD-UNSPEC
94101 BURN NOS EAR
94103 BURN NOS LIP
94104 BURN NOS CHIN
94105 BURN NOS NOSE
94106 BURN NOS SCALP
94107 BURN NOS FACE NEC
94108 BURN NOS NECK
94109 BURN NOS HEAD-MULT
94110 1ST DEG BURN HEAD NOS
94111 1ST DEG BURN EAR
94113 1ST DEG BURN LIP
94114 1ST DEG BURN CHIN
94115 1ST DEG BURN NOSE
94116 1ST DEG BURN SCALP
94117 1ST DEG BURN FACE NEC
94118 1ST DEG BURN NECK
94119 1ST DEG BURN HEAD-MULT
94120 2ND DEG BURN HEAD NOS
94121 2ND DEG BURN EAR
94123 2ND DEG BURN LIP
94124 2ND DEG BURN CHIN
94125 2ND DEG BURN NOSE
94126 2ND DEG BURN SCALP
94127 2ND DEG BURN FACE NEC
94128 2ND DEG BURN NECK
94129 2ND DEG BURN HEAD-MULT
94130 3RD DEG BURN HEAD NOS
94131 3RD DEG BURN EAR
94133 3RD DEG BURN LIP
94134 3RD DEG BURN CHIN
94135 3RD DEG BURN NOSE
94136 3RD DEG BURN SCALP
94137 3RD DEG BURN FACE NEC
94138 3RD DEG BURN NECK
94139 3RD DEG BURN HEAD-MULT
94140 DEEP 3 DEG BURN HEAD NOS
94141 DEEP 3RD DEG BURN EAR
94143 DEEP 3RD DEG BURN LIP
94144 DEEP 3RD DEG BURN CHIN
94145 DEEP 3RD DEG BURN NOSE
94146 DEEP 3RD DEG BURN SCALP
94147 DEEP 3RD BURN FACE NEC
94148 DEEP 3RD DEG BURN NECK
94149 DEEP 3 DEG BRN HEAD-MULT
94150 3RD BURN W LOSS-HEAD NOS
94151 3RD DEG BURN W LOSS-EAR
94153 3RD DEG BURN W LOSS-LIP
94154 3RD DEG BURN W LOSS-CHIN
94155 3RD DEG BURN W LOSS-NOSE
94156 3RD DEG BURN W LOSS-SCALP
94157 3RD BURN W LOSS-FACE NEC
94158 3RD DEG BURN W LOSS-NECK
94159 3RD BRN W LOSS-HEAD MULT
94200 BURN NOS TRUNK-UNSPEC
94201 BURN NOS BREAST
94202 BURN NOS CHEST WALL
94203 BURN NOS ABDOMINAL WALL
94204 BURN NOS BACK
94205 BURN NOS GENITALIA
94209 BURN NOS TRUNK NEC
94210 1ST DEG BURN TRUNK NOS
94211 1ST DEG BURN BREAST
94212 1ST DEG BURN CHEST WALL
94213 1ST DEG BURN ABDOMN WALL
94214 1ST DEG BURN BACK
94215 1ST DEG BURN GENITALIA
94219 1ST DEG BURN TRUNK NEC
94220 2ND DEG BURN TRUNK NOS
94221 2ND DEG BURN BREAST
94222 2ND DEG BURN CHEST WALL
94223 2ND DEG BURN ABDOMN WALL
94224 2ND DEG BURN BACK
94225 2ND DEG BURN GENITALIA
94229 3RD DEG BURN TRUNK NEC
94230 3RD DEG BURN TRUNK NOS
94231 3RD DEG BURN BREAST
94232 3RD DEG BURN CHEST WALL
94233 3RD DEG BURN ABDOMN WALL
94234 3RD DEG BURN BACK
94235 3RD DEG BURN GENITALIA
94239 3RD DEG BURN TRUNK NEC
94240 DEEP 3RD BURN TRUNK NOS
94241 DEEP 3RD DEG BURN BREAST
94242 DEEP 3RD BURN CHEST WALL
94243 DEEP 3RD BURN ABDOM WALL
94244 DEEP 3RD DEG BURN BACK
94245 DEEP 3RD BURN GENITALIA
94249 DEEP 3RD BURN TRUNK NEC
94250 3RD BRN W LOSS-TRUNK NOS
94251 3RD BURN W LOSS-BREAST
94252 3RD BRN W LOSS-CHEST WLL
94253 3RD BRN W LOSS-ABDOM WLL
94254 3RD DEG BURN W LOSS-BACK
94255 3RD BRN W LOSS-GENITALIA
94259 3RD BRN W LOSS-TRUNK NEC
94300 BURN NOS ARM-UNSPEC
94301 BURN NOS FOREARM
94302 BURN NOS ELBOW
94303 BURN NOS UPPER ARM
94304 BURN NOS AXILLA
94305 BURN NOS SHOULDER
94306 BURN NOS SCAPULA
94309 BURN NOS ARM-MULTIPLE
94310 1ST DEG BURN ARM NOS
94311 1ST DEG BURN FOREARM
94312 1ST DEG BURN ELBOW
94313 1ST DEG BURN UPPER ARM
94314 1ST DEG BURN AXILLA
94315 1ST DEG BURN SHOULDER
94316 1ST DEG BURN SCAPULA
94319 1ST DEG BURN ARM-MULT
94320 2ND DEG BURN ARM NOS
94321 2ND DEG BURN FOREARM
94322 2ND DEG BURN ELBOW
94323 2ND DEG BURN UPPER ARM
94324 2ND DEG BURN AXILLA
94325 2ND DEG BURN SHOULDER
94326 2ND DEG BURN SCAPULA
94329 2ND DEG BURN ARM-MULT
94330 3RD DEG BURN ARM NOS
94331 3RD DEG BURN FOREARM
94332 3RD DEG BURN ELBOW
94333 3RD DEG BURN UPPER ARM
94334 3RD DEG BURN AXILLA
94335 3RD DEG BURN SHOULDER
94336 3RD DEG BURN SCAPULA
94339 3RD DEG BURN ARM-MULT
94340 DEEP 3 DEG BURN ARM NOS
94341 DEEP 3 DEG BURN FOREARM
94342 DEEP 3 DEG BURN ELBOW
94343 DEEP 3 DEG BRN UPPER ARM
94344 DEEP 3 DEG BURN AXILLA
94345 DEEP 3 DEG BURN SHOULDER
94346 DEEP 3 DEG BURN SCAPULA
94349 DEEP 3 DEG BURN ARM-MULT
94350 3RD BURN W LOSS-ARM NOS
94351 3RD BURN W LOSS-FOREARM
94352 3RD BURN W LOSS-ELBOW
94353 3RD BRN W LOSS-UPPER ARM
94354 3RD BURN W LOSS-AXILLA
94355 3RD BURN W LOSS-SHOULDER
94356 3RD BURN W LOSS-SCAPULA
94359 3RD BURN W LOSS ARM-MULT
94400 BURN NOS HAND-UNSPEC
94401 BURN NOS FINGER
94402 BURN NOS THUMB
94403 BURN NOS MULT FINGERS
94404 BURN NOS FINGER W THUMB
94405 BURN NOS PALM
94406 BURN NOS BACK OF HAND
94407 BURN NOS WRIST
94408 BURN NOS HAND-MULTIPLE
4410 1ST DEG BURN HAND NOS
94411 1ST DEG BURN FINGER
94412 1ST DEG BURN THUMB
94413 1ST DEG BURN MULT FINGER
94414 1 DEG BURN FINGR W THUMB
94415 1ST DEG BURN PALM
94416 1 DEG BURN BACK OF HAND
94417 1ST DEG BURN WRIST
94418 1ST DEG BURN HAND-MULT
94420 2ND DEG BURN HAND NOS
94421 2ND DEG BURN FINGER
94422 2ND DEG BURN THUMB
94423 2ND DEG BURN MULT FINGER
94424 2 DEG BURN FINGR W THUMB
94425 2ND DEG BURN PALM
94426 2 DEG BURN BACK OF HAND
94427 2ND DEG BURN WRIST
94428 2ND DEG BURN HAND-MULT
94430 3RD DEG BURN HAND NOS
94431 3RD DEG BURN FINGER
94432 3RD DEG BURN THUMB
94433 3RD DEG BURN MULT FINGER
94434 3 DEG BURN FINGR W THUMB
94435 3RD DEG BURN PALM
94436 3 DEG BURN BACK OF HAND
94437 3RD DEG BURN WRIST
94438 3RD DEG BURN HAND-MULT
94440 DEEP 3 DEG BRN HAND NOS
94441 DEEP 3 DEG BURN FINGER
94442 DEEP 3 DEG BURN THUMB
94443 DEEP 3RD BRN MULT FINGER
94444 DEEP 3RD BRN FNGR W THMB
94445 DEEP 3 DEG BURN PALM
94446 DEEP 3RD BRN BACK OF HND
94447 DEEP 3 DEG BURN WRIST
94448 DEEP 3 DEG BRN HAND-MULT
94450 3RD BRN W LOSS-HAND NOS
94451 3RD BURN W LOSS-FINGER

Table B-32.—Alternative DRG For Non-Extensive Burns Without Operating Room Procedure—Continued

94452 3RD BURN W LOSS-THUMB
94453 3RD BRN W LDSS-MULT FNGR
94454 3RD BRN W LOSS-FNGR/THMB
94455 3RD BURN W LOSS-PALM
94456 3RD BRN W LOSS-BK OF HND
94457 3RD BURN W LOSS-WRIST
94458 3RD BRN W LOSS HAND-MULT
945DD BURN NOS LEG-UNSPEC
945D1 BURN NOS TOE
945D2 BURN NOS FDDT
945D3 BURN NOS ANKLE
945D4 BURN NOS LOWER LEG
945D5 BURN NOS KNEE
94506 BURN NOS THIGH
94509 BURN NOS LEG-MULTIPLE
94510 1ST DEG BURN LEG NOS
94511 1ST DEG BURN TDE
94512 1ST DEG BURN FDDT
94513 1ST DEG BURN ANKLE
94514 1ST DEG BURN LOWER LEG
94515 1ST DEG BURN KNEE
94516 1ST DEG BURN THIGH
94519 1ST DEG BURN LEG-MULT
9452D 2ND DEG BURN LEG NOS
94521 2ND DEG BURN TOE
94522 2ND DEG BURN FOOT
94523 2ND DEG BURN ANKLE
94524 2ND DEG BURN LDWER LEG
94525 2ND DEG BURN KNEE
94526 2ND DEG BURN THIGH
94529 2ND DEG BURN LEG-MULT
9453D 3RD DEG BURN LEG NOS
94531 3RD DEG BURN TDE
94532 3RD DEG BURN FODT
94533 3RD DEG BURN ANKLE
94534 3RD DEG BURN LDW LEG
94535 3RD DEG BURN KNEE
94536 3RD DEG BURN THIGH
94539 3RD DEG BURN LEG-MULT
9454D DEEP 3RD DEG BRN LEG NOS
94541 DEEP 3RD DEG BURN TOE
94542 DEEP 3RD DEG BURN FODT
94543 DEEP 3RD DEG BURN ANKLE
94544 DEEP 3RD DEG BRN LOW LEG
94545 DEEP 3RD DEG BURN KNEE
94546 DEEP 3RD DEG BURN THIGH
94549 DEEP 3 DEG BURN LEG-MULT
9455D 3 DEG BRN W LOSS-LEG NDS
94551 3 DEG BURN W LOSS-TDE
94552 3 DEG BURN W LDSS-FOOT
94553 3 DEG BURN W LDSS-ANKLE
94554 3 DEG BRN W LDSS-LDW LEG
94555 3 DEG BURN W LDSS-KNEE
94556 3 DEG BURN W LDSS-THIGH
94559 3 DEG BRN W LOSS LEG-MLT
946D BURN NDS MULTIPLE SITE
9461 1ST DEG BURN MULT SITE
9462 2ND DEG BURN MULT SITE
9463 3RD DEG BURN MULT SITE
9464 DEEP 3 DEG BRN MULT SITE
9465 3RD BRN W LOSS-MULT SITE
9478 BURN INTERNAL ORGAN NEC
9479 BURN INTERNAL ORGAN NOS

SOURCE: ProPAC analysis.

INPATIENT HOSPITAL DIAGNOSTIC AND PROCEDURAL CODING FOR MEDICARE PAYMENT

Introduction

Adoption of the Medicare PPS payment system has focused great attention on diagnostic and procedural coding in the hospital inpatient setting. This overview seeks to provide a better understanding of the coding process and its significance, as well as greater realization of the complexities of the code assignment process for Medicare payment in the PPS system.

The *International Classification of Diseases* was most recently revised, for use clinically, in 1978. The clinical modification, ICD-9-CM, is currently used in all U.S. acute hospitals and is required by Medicare for coding of both inpatient diagnoses and procedures. Responsibility for the maintenance of Volumes 1 and 2 (tabular list and index) resides in the National Center for Health Statistics (NCHS); it shares with HCFA the responsibility for maintaining Volume 3 (the procedure classification).

In 1983, HCFA began requiring hospitals to use ICD-9-CM to submit coded data to the agency. Since its initial printing there have been three sets of comprehensive errata (the third errata released in 1983 has not yet been adopted by HCFA for use in coding for Medicare claims). The errata were issued to correct several errors in earlier printing such as: new procedures and technologies needed code assignments; in addition, a few changes were required in Volume 1 to account for the assignment of new diseases to an existing code (i.e., toxic shock syndrome) or updates and clarifications related to current codes. Further, several clerical errors needed correction.

Participants in Coding Decisions

Currently there are four groups primarily involved in coding decision-making. They are the National Center for Health Statistics (NCHS), the American Hospital Association (AHA), the American Medical Record Association (AMRA), and the Health Care Financing Administration (HCFA). A discussion of each group's specific involvement with ICD-9-CM coding follows:

National Center for Health Statistics (NCHS)

NCHS houses the World Health Organization's (WHO) Center for Classification of Diseases for North America and has the responsibility for approving ICD and ICD-9-CM interpretations, modifications, addenda, and errata in the U.S. NCHS has the final say involving interpretation of codes and additional assignments for existing codes. During the summer of 1985 a new committee was established by NCHS and HCFA to provide for revisions and modifications to ICD-9-CM, with emphasis upon Volume 3, Procedures. The announcement of the committee formation was published in the *Federal Register* on August 16, 1985. The Committee, co-chaired by NCHS and HCFA, is scheduled to meet quarterly. Its composition is strictly federal and includes representatives from HCFA, NCHS, the Veteran's Administration, and the Department of Defense.

The main functions of the Committee include: 1) consideration of errata and/or addenda as well as other modifications of the ICD-9-CM to reflect new procedures and technologies and newly identified diseases and coding problems; and 2) promotion of the use of federal and non-federal educational programs and other communication techniques to standardize coding applications and to upgrade the quality of coded data. The Committee plans to review and research topics presented. Final decisions will be made by senior staff of NCHS and HCFA and then published in the *Federal Register*.

NCHS is also responsible for approval of all code interpretations and assignments by the AHA Central Coding Office on ICD-9-CM prior to dissemination. Most of this process is done via telephone. Currently, NCHS does not prepare any educational materials and depends upon private groups such as AMRA to do this. However, continuous maintenance of the ICD-9-CM is the responsibility of the federal government.

The U.S. National Committee on Vital and Health Statistics is an advisory committee to the Secretary of HHS on health related statistics and matters. It has several subcommittees including

the Subcommittee on Disease Classification, which reviews matters related to ICD-10. The committee also revises the Uniform Hospital Discharge Data Set (UHDDS); the latest revision was effective January 1, 1986.

American Hospital Association (AHA) Central Office on ICD-9-CM

The AHA Central Office on Coding was established in the mid-sixties and contracts with NCHS to function as the clearinghouse for ICD(-9-CM) coding questions. A recent effort by AHA to educate coders is the year-old publication, *CODING CLINIC (CC)*. This newsletter is published on a bi-monthly basis and contains current advice on code assignment for new diagnoses, technologies or procedures as well as interpretation of existing codes and guidelines. The Coding Clinic advisory panel includes representatives from both the public and private sector, and provides guidance on publication content. Prior to publication the four cooperating parties - NCHS, HCFA, AHA and AMRA - must be in full agreement on any given question or issue.

American Medical Record Association (AMRA)

AMRA provides support in the coding arena. AMRA's primary mission is education of its membership. AMRA has presented various coding seminars and has printed a definitive coding manual for entry-level coders. The *JOURNAL OF THE AMERICAN MEDICAL RECORD ASSOCIATION (JAMRA)* is the vehicle agreed upon by NCHS for the printing of all errata to ICD-9-CM.

Health Care Financing Administration (HCFA)

With the advent of PPS, UB-82, and PROs, HCFA has assumed a very active role in the areas of data collection and data quality. HCFA is actively involved in coding decisions that affect the Medicare program. As indicated, HCFA joined with NCHS to design and implement the ICD-9-CM Coordination and Maintenance Committee. HCFA oversees Grouper issues through a contract with Health Systems International (HSI) to produce official Grouper modifications. HCFA also developed and implemented the Medicare Code Editor for fiscal intermediaries' (FIs) use in editing claims data.

Coding Assignment/Interpretation Process

The current procedure for either updating current codes or assigning new codes involves a telephone request or a letter to AHA's Central Office on ICD-9-CM. That office's director researches the issue, makes the initial decision, and then must obtain the approval of NCHS and HCFA prior to dissemination.

The procedure for interpretation of all three volumes of ICD-9-CM is approximately the same. A person needing coding advice must call or write the Central Office on Coding and await a response. The time requirement for such responses varies considerably.

Coding for Medicare Claims

All inpatient and outpatient hospital bills must be sent to the fiscal intermediary on HCFA form 1450 (UB-82). UB-82 was developed by the National Uniform Billing Committee and was adopted for use in 1982. The form was designed to be useful not only for government programs but for private insurors as well. The ninety-six (96) data elements include spaces for principal diagnosis, four additional diagnoses, principal procedure, and two additional significant procedures. As of April 1, 1985 hospitals must also provide an admitting diagnosis code. All codes must be in ICD-9-CM using only errata/supplements approved by HCFA in connection with the Medicare program.

After the bill is completed it is forwarded to the fiscal intermediary (FI) for editing and approval for payment. It is also at this time that PRO review takes place, if required. The editing process involves matching the bill against the Medicare Code Editor (MCE) to see if there are any coding problems. The MCE is a system of edits developed by HCFA to detect incorrect billing data. After the editing is completed DRG assignment is made.

The Medicare Code Editor was designed to identify and eliminate coding problems including

those with sex-specific diagnoses, non-specific diagnoses, invalid codes, codes unacceptable as principal diagnoses and non-specific operating room procedures. The MCE can be used at the hospital level since most DRG software incorporates the edits into its programs. The edits, however, must be performed at the FI level.

As an example of the complexity of coding decisions, ProPAC noted the edit that seeks to determine whether a biopsy performed in the hospital was open (a body cavity entered surgically) or closed (via percutaneous or endoscopic routes). ICD-9-CM does not differentiate in all cases as to whether the biopsy was performed surgically or otherwise. HCFA has made an arbitrary decision to assign certain codes for open biopsies and certain codes for closed biopsies. These changes were made independent of NCHS and AHA and did not conform to standard coding practices. If an open biopsy code appears in any of the three spaces for procedures the hospital must send an operating room report to the intermediary which validates the procedure. This edit procedure, which alters what is reported to HCFA, does not follow conventional coding guidelines.

HCFA has made other administrative changes due to problems with the ICD-9-CM coding system. For example, PTCA was assigned code 36.0, Removal of Coronary Artery Obstruction. From a classification standpoint, it fits very well with other angioplasties; from a DRG standpoint, however, it is unlike other procedures grouped into the DRG with respect to resource use. The proposed new Grouper regulations, which are consistent with ProPAC recommendations, propose to place code 36.0 in a DRG more similar in resource consumption.

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DESCRIPTION OF FIVE ALTERNATIVE PATIENT CLASSIFICATION SYSTEMS

Introduction

Since the development of the DRGs and the implementation of PPS several alternative patient classification systems have emerged. These systems vary by type and number of independent and dependent variables used to cluster patients, the objectives for which they were developed, and their stage of development.[21]

Williams *et al.* (1984) differentiate case mix measures by the nature of the methods used to create them. Some case-mix measures use clini cal dimensions to define groups of similar patients and then apply statistical methods to evaluate the results. Examples of this method include staging and the patient severity of illness index. The DRG system uses both statistical methods and clinical judgments to define groups of similar patients. The severity of illness index is generic in that it can be applied to other systems to subdivide categories. Some systems were designed for application upon patient admission (APACHE II; MEDISGRPS), others for application upon discharge (patient management categories; staging).

What follows are brief synopses of the major characteristics of five alternative classification systems. Taken together they reflect a number of trends in the development of classification systems since the implementation of DRGs: 1) the use of more objective, clinical data in group formation, 2) expanding data bases for system testing and iterative revision, 3) consideration of (ICD-9-CM) coding system guidelines, 4) utilization of multiple diagnoses to describe conditions, 5) attempts to differentiate resource utilization from clinical characteristics for grouping purposes, and 6) attempts to combine systems with the DRGs to reduce variation within groups and achieve more equitable payment.

APACHE II (Acute Physiology and Chronic Health Evaluation)

The APACHE II system was originally designed for application to ICU patients. Research has demonstrated that the system can be used to predict hospital survival and therapeutic effort. An underlying philosophy of the system is that one unifying characteristic of ICU patients is their acute level of illness severity.

The APACHE II system (a revised version of the original APACHE system) consists of physiological measurements obtained upon patient admission to the ICU. Because the system is based upon objective physiological measurements, its applicability is independent of therapy.

The current system utilizes a patient score based on admission values of twelve (12) routine physiological measurements, age, and previous health status in order to provide a general measure of severity. A variation of the nominal group process was used by ICU physicians to identify the variables and the method for weighting them.

The acute physiology score (APS) is comprised of the sum of the weights of the 12 admission measurement variables. The variables are: temperature, mean arterial pressure, heart rate, respiratory rate, oxygenation, arterial ph, serum sodium, serum potassium, serum creatinine, hematacrit, white blood count, and glasgow coma score. All 12 values underlie grouping.

A weighting system of 0 to 4 is used for each of the variables. A weighting system also assigns points on the basis of the patient's age (for example, no points are added if the patient is 44 years old or less but 6 points are added if the patient is age 75 or greater). Additional points are also added if the patient has a history of severe organ system insufficiency (5 points) or is immunocompromised (2 points). Therefore, the APACHE II score is the sum of the APS, age points, and chronic health points.

The system has been used successfully to stratify acutely ill patients by risk of death. The proponents of the system emphasize, however, that the main use of the system is to describe prognosis for groups of patients and not individuals. Additional studies testing APACHE for inclusion in a payment system are planned.

[21] A bibliography follows the synopses.

Disease Staging

The Disease Staging system, developed and refined over a ten year period by SysteMetrics, embodies four major elements: 1) a definition of severity as the likelihood of death or residual impairment as the result of a disease, without consideration of treatment; 2) a definition of disease as a process of disruption in the normal homeostasis of psychological and physiological systems; 3) a distinction between disease and health problems, and conditions for the purposes of classification; and 4) a diagnosis encompassing four elements in order to define a disease: location of the problem, manifestations of the medical problem, cause of the problem, and severity of the problem.

Staging is viewed as an approach to measuring disease severity. Criteria have been developed for both manual application to medical records and automated application to computerized hospital discharge abstract data. In staging, diseases are generically divided into categories of increasing levels of severity. The system does not depend upon actual utilization patterns or on expected response to therapy, but is based on a conceptual model of the disease process itself.

To create the system an analysis was performed of the diagnosis frequency distribution of 387,000 hospital discharge abstracts; coding manuals were also reviewed. This process resulted in identification of 400 conditions. Physician consultants participated in the actual development of the staging criteria. Every condition was divided into at least 4 primary stage categories and as many substages as was considered appropriate. The development process was thus largely medically oriented, emanted from an iterative process, and considered reflected coding nuances in the development of the automated system.

Each substage places the patient at a significantly higher risk of morbidity and/or mortality than the previous substage. The system reflects the progression of disease into discrete stages that can be defined and detected clinically, that reflect the severity of the disease, and that have clinical significance for prognosis and the choice of treatment modality. The system considers single disease entities, not complications arising from a simultaneous, unrelated condition, or the patient's age. The four major stages of increasing levels of severity are:

1. diagnosis is certain and no complications are present, either local or systemic;
2. disease process is limited to an organ or system, with a significantly increased risk of complications;
3. multiple site involvement; generalized systemic involvement; poor prognosis; and
4. death.

Each staging criteria set consists of the medical definition of each stage and substage, alternative descriptions or synonyms for the conditions, complications and manifestations, and objective evidence that can be used to validate the presence of each complication or condition.

The automated staging criteria have been established so that a patient record can always be staged in at least one disease category (and often can be staged in many). For stage assignment the software searches all diagnosis codes, sex , and discharge status, and occasionally procedure.

The software logic is such that the coded staging criteria "knows" which diagnosis and procedures a patient record must have to qualify for a particular stage of a given disease category. Since the logic of the staging criteria is embedded in the software, the staging software is able to consider the relationships between combinations of input codes, rather than look at each code in isolation. These relationships were designed into the software and ICD codes identified to describe them. Some catch-all coded criteria have been developed for particular organs or body systems to handle residual cases.

The software logic imposes an ordering on the diagnostic codes. The staging algorithm scans all coded diagnoses and uses the relationships among the codes to identify the underlying condition of highest severity. The highest stage match is assigned to the patient except in case of death when the patient is always assigned to stage four. The literature describes the automated staging algorithm in detail. A revised version of the staging criteria was recently released. Refinements to the system include:

- modifications to the clinical criteria,

- creation of clinical criteria for "catch-all" categories,
- correction of individual codes and combinations of codes within criteria sets.

Medical Illness Severity Grouping System (MEDISGRPS)

The Medical Illness Severity Grouping System (MEDISGRPS) uses objective clinical findings present upon patient admission to classify patients into severity groups reflecting the probability of organ failure. The groups are reported to be homogeneous in that they reflect statistically significant differences in mortality and morbidity rates, as well as in average hospital charges.

Originally designed for use in hospital quality and cost control, the original data base consisted of 16,000 patient admitted between 10/1/82 and 6/30/83 at Saint Vincent's Hospital in Worcester, Massachusetts, a 578 bed teaching hospital. Admissions are classified into groups (severity is assigned) within three days of admission. (The three day period is a result of the observed lag time in medical record documentation for the variables need for grouping). Severity is reassessed on the 10th hospital day or the 6th postoperative day and compared with admission severity. By measuring changes in severity during hospitalization the results of care provided are monitored.

The patient's physiological status, as reflected by key clinical findings (KCFs) at admission, underlies the grouping of patients. KCFs are objective indicators of an abnormal situation. Each KCF is assigned to a severity group. Patients are placed into one of five severity groups within 1 of 67 reasons for admission. "Reasons for admission" is used as a clinically meaningful way to group patients; however, the KCFs are the only factor used to determine severity group assignment. (Examples of reasons for admission include: elective surgery, pregnancy and labor, newborns, abdominal pain, shortness of breath and chest pain.) Patients are grouped as follows:

0—no findings (no KCFs occur)
1 minimal findings (low potential for organ failure)
2—severe or acute findings (high potential for organ failure but not imminent)
3—severe and acute findings (high potential for organ failure and a short time course)
4—critical findings (organ failure is present)

Patients are assigned to the highest group for which a KCF is present. If the record has several values for a given KCF, the most abnormal value is used. Five hundred (500) KCFs have been developed for all patients except psychiatric, based upon laboratory, radiology, and pathology test results as well as physical examination findings.

The system does not use diagnoses to group patients. Because severity is assigned at admission, this system may overcome the problems associated with assigning severity distinctions during the patient's stay or upon discharge. The influence of severity due to occurences during the hospitalization is likely to be eliminated.

KCFs were developed after observing house officers at morning rounds when information is relayed regarding patients' status. After initial aggregation of KCFs into severity groups, Saint Vincent physicians (specialists and generalists) validated and refined the initial groups. The system's development is reported to be largely iterative (i.e., clinical opinion was used to refine the groupings over time). The system, while requiring a record review, has been automated to permit on-line data entry and assignment of severity using data abstracted from the medical record.

Patient Management Categories

Patient Management Categories (PMCs), developed by Blue Cross of Western Pennsylvania under a HCFA grant, used an original data base from 90 Western Pennsylvania hospitals (approximately 800,000 cases from fiscal years 1981, 1982, 1983). In further testing, additional data was used from 55 Maryland hospitals (624,335 cases from fiscal year 1983). The results include: 1) a patient classification system consisting of 800 PMCs; 2) patient management paths that specify "types and quantities of services required to effectively manage typical patients in the categories"; and 3) a relative cost weight for each PMC (using hospital cost data).

The PMCs were developed to differentiate clinically distinct case types that should be managed

similarly, as well as to identify and incorporate severity distinctions among patient types; the latter goal was directed toward reflecting expected differences in patient management and hospital resource requirements. The groups were designed to be clinically homogeneous. The system itself was intended to be independent from actual utilization patterns; characteristics of patients' illness and/or the clinical manifestations of a specific disease form its basis.

Panels of physicians from Western Pennsylvania developed the PMCs. Each category was designed to be clinically specific enough to enable physicians to infer similar clinical management for all patients assigned to the category. These categories were then matched to appropriate ICD-9-CM codes to permit automation. A two part computerized selection process assigns patients to one or more appropriate disease groups. (Assignment to more than one PMC can occur with instances of comorbidity.)

A hierarchy of codes facilitates the incorporation of levels of severity within the categories themselves. (Severity relates to the increased probability of death or disability and/or more complicated management.) Category assignment is not affected by the sequence of diagnoses. To the extent that this is accomplished and is desirable, PMCs may address the often cited shortcoming of the DRGs, that is, their lack of ability to distinguish severity and comorbidity.

For data the system relies upon patient discharge information. While information assignment is based mostly on diagnoses codes, age and sex are utilized in several categories for assignment decisions; in other categories, treatment (procedure) codes are used to categorize patients.

To automate the system, physicians built a hierarchy of categories into the classification software. Disease or disorder groups form a distinct set of programming instructions (called a module) within that software. Two other modules, "supplementary category" and "surgical complication" are included; there is also one default category, "ambulatory/nonspecific diagnoses." The supplementary category refers to occasions where there were legitimate reasons for admission but the etiology of the disease could not be determined (i.e. chest or stomach pain; septicemia). The ambulatory/non-specific category is a catch-all category, used when the diagnosis does not fall into any other category.

Severity of Illness Index

Susan Horn of Johns Hopkins University, assisted by a panel of physicians and nurses, developed a generic severity of illness index requiring review of the entire patient medical record. An automated version of the index is expected to be released in summer 1986.

Seven individual dimensions are used to compile the overall manual severity score. The specific dimensions are:

- stage of principal diagnosis;
- complications that developed during the hospital stay due to the principal diagnosis or as a direct result of therapy;
- concurrent interacting conditions affecting the hospital stay;
- dependency on hospital staff and facilities;
- diagnostic and therapeutic procedures performed outside the operating room (extent of non-operating room life support procedures);
- rate of response to therapy or rate of recovery;
- impairment remaining after therapy for the acute aspect of hospitalization.

Raters score each of these seven dimensions in 1 of 4 levels of increasing severity.

The index was designed to produce groups that were homogeneous with respect to burden of illness. The quality of care received by the patient is not explicitly considered; thus no distinction is made between increased severity due to less than optimal care or hospital induced complications. Patients are placed into higher severity levels whether they enter the hospital more severely ill or whether they become more severely ill while hospitalized.

The automated system will require the addition of a sixth digit to the ICD-9-CM diagnosis codes in order to describe the severity of illness for each disease. The automated system will also necessi-

tate the collection of an indicator of the patient's rate of response to therapy. Finally, data elements, such as physical signs and symptoms and laboratory and radiology data, are being defined for each disease in order to quantify levels of severity and allow a severity of index level to be defined for each disease coded.

The conceptualization behind the computerized severity index is the quantification of a patient's total burden of illness expressed as a combination of:

- the clinical problem: the principal diagnosis that brought the patient into the hospital, with the sixth digit reflecting the severity of the principal diagnosis;
- the clinical context/environment: the complications and/or comorbidities the patient experiences during the hospitalization, with the sixth digit coded for each secondary diagnosis reflecting its severity; and, if desired,
- the individual response; the patient's individudal response to the illness.

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Appendix C

Cross-Cutting Issues

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INTRODUCTION

The first two technical appendixes group material according to the major legislatively mandated ProPAC activities: recommendation of an update factor and improvements in the DRG classification system.

The purpose of this third appendix is to present important background material concerning two subjects the Commission came to view as "cross-cutting" the entire spectrum of mandated activity. The remainder of the section comprises materials dealing with quality of care issues under PPS. The materials begin with the summary of a ProPAC commissioned study analyzing beneficiary perceptions of quality of care as contained in some of their letters to beneficiary rights organizations, as well as in media reports. The section then presents information regarding professional society studies of quality of care, and ProPAC's review of data bases related to quality of care research.

In addition, there is a description of two mechanisms—Peer Review Organizations and the beneficiary appeals process—that are intended to serve, albeit in different ways, as quality of care monitors.

Another of these cross-cutting issues, the transition to national urban and rural payment amounts, is addressed by the last section's, which contains the analytical basis for the Commission's recommendation of a transition pause.

QUALITY OF CARE UNDER PPS: PERCEPTIONS, QUALITY OF CARE DATA, AND QUALITY ASSURANCE MECHANISMS

BENEFICIARY AND PROFESSIONAL PERCEPTIONS OF PPS QUALITY OF CARE

Background Research on the Perceived Effects of Medicare PPS on Quality of Care[1]

Overview

Introduction.—Since the first day that Medicare's prospective payment system (PPS) was in operation, concerns about maintaining the quality of care provided to beneficiaries have been voiced by many disparate groups. Advocacy groups for beneficiary rights like the American Association of Retired Persons (AARP) and the Gray Panthers, have been joined by the American Medical Association, the American Hospital Association, and the American Nurses' Association among others in supporting the need to monitor the effects of the new payment system on the quality of patient care. The House of Representatives and Senate Committee on Aging have heard testimony from providers and beneficiaries that there have been a number of incidents of poor quality care related to PPS incentives.

These activities have generated a number of reports in the media which have raised the public's consciousness about the potential for poor quality because of the incentives inherent in a per-case payment system. The following discussion is based on a review of the kinds of issues raised in

[1]This section contains the Executive Summary of a study by Kathleen A. Calore, M.A. and Helene T. Hewes, B.S., Health Economics Research Inc., Needham, Massachusetts for the Prospective Payment Assessment Commission under contract number T-31415512.

these incidents without attempting to determine the rightness or wrongness of the incidents themselves. Rather than a study of the actual effects of PPS on quality, its focus is the *perceptions* concerning PPS effects on quality.

Policy Perspective.—It is not difficult to identify the incentives within the PPS system that might alter the perceptions about quality of care. PPS encourages hospitals to limit the length of stay; in addition hospitals are also rewarded if they:

- *limit the services* provided during the stay;
- *encourage efficiency* in providing services;
- *encourage alternative providers* including home health care, long-term care and ambulatory surgery.

Each of these incentives has the potential to seriously affect quality if left unchecked. The Peer Review Organization (PRO) program was designed to monitor the activity of hospitals under prospective payment to provide just such a check. Ironically PROs have also become the target for much of the beneficiary dissatisfaction with Medicare because they are perceived as more concerned with limiting utilization rather than protecting quality.

The discrimination in access to care traditionally faced by the uninsured may become an obstacle for the severely ill. Will hospitals "dump" patients who are unprofitable? Are Medicare patients underinsured because the PPS payments are not adequate to pay for care of the very sick who will, under PPS then be discharged prematurely or denied admission? The perceptions of the beneficiaries reflect the actions taken by hospitals in response to PPS. Beneficiaries perceive that their insurance benefits under Medicare have been reduced and that more of the burden has been shifted to them and their families.

Value of Perceptions.—The problem inherent with an evaluation of quality is that it is a concept that lacks a clear and objective definition and one that may be more apparent in its absence than its presence. Other researchers have set about to evaluate quality of care under PPS by a careful and extensive evaluation of existing process and outcome measures. This evaluation of perceptions however, is dependent solely on the stories reported in the media and the experience of beneficiaries in their own words. Although we cannot determine whether the care provided was appropriate, we can identify the most frequently mentioned perceptions or misperceptions about quality of care under the new regime.

While the incidents reported in the media represent an exceedingly small number of Medicare admissions, they have tremendous power to shape public opinion concerning the Medicare program. The inclusion of details of an elderly person's treatment adds a necessary human element to what would be a somewhat dull story about hospital reimbursement. The details are typically sketchy, but sufficient to generate considerable concern about the care provided to Medicare beneficiaries. In comments about the treatment that PPS had received in the media, a PRO spokesperson commented:

> PPS was uninteresting news initially. No one wanted to talk to us. Reporting the hearings (Senate Special Committee on Aging) made it sensationalism.
>
> —*A PRO Executive Director*

The most significant contribution that this review offers is that it allows policy-makers the opportunity to hear, in the words of beneficiaries, how Medicare has not met his or her expectations concerning health care. Further, key issues identified may direct the activities of policy-makers to improve the relationship of Medicare by increasing beneficiary and provider understanding of PPS and by illustrating to HCFA the impacts on beneficiaries.

The most significant limitation of the approach is the negative reporting bias. That is, the findings do not represent the opinions of a random sample of beneficiaries but rather represent the solicited complaints of those dissatisfied with their treatment. Of the millions of hospital admissions since PPS began, the collected incidents do not represent all the dissatisfied beneficiaries, they are only those who were moved to complain either to the press, to AARP, or to the PRO. Although a few solicited letters praised the quality of care

the beneficiary had received, the vast majority were highly critical of the system.

Methodology

Sources of Perceptions.—The original research design called for a review of quality related incidents reported in the media as the basis of a discussion of areas where quality may be most affected by PPS. An extensive review of seven major newspapers for the period January 1, 1984 through May 30, 1985 supplemented by articles from an automated search of a data base including articles from the major news services and weeklies surprisingly yielded few incidents.[2]

Hence the interviews with the players involved in PPS from both the provider and regulatory communities became even more important. The interviews were included for two purposes: first to offer the views of providers and PROs as counterpoint to those of beneficiaries. Further, in order to provide some larger context in which to evaluate beneficiary perceptions, we asked hospital administrators, PRO Executive Directors and other industry spokespersons about the incentives of PPS and how institutions have adapted to them. The media reports and the interviews isolated key areas of concern about quality. The following discussion of issues is based on cases presented in the media, on impressions gained from our interviews and from the letters from beneficiaries.

The following discussion of the prevalent attitudes about PPS is based on three sources: a review of 45 recent newspaper articles containing incidents related to the prospective payment system, 70 letters from beneficiaries solicited by the American Association of Retired Persons as well as letters to selected PROs, and 25 interviews with providers, PRO representatives, and consumer advocates.

Who's to Blame?—The methodology applied here does not allow us to provide the answer to this question. The purpose of the analysis is to present the viewpoint of those most directly affected by the change in hospital payment. We are only able to present a discussion of the facts presented, however incomplete they may be. Hence, no attempt is made to decide the merits of a case or to assign responsibility.

As one might expect, no provider group accepted the premise that quality had been affected adversely, although many expressed fears that hospitals would soon be cutting to the bone and the quality of care might fall victim to the financial constraints Medicare has imposed.

Beneficiaries all identified Medicare, or the PRO acting for Medicare, as the culprit. With few exceptions, beneficiaries did not place blame on the hospital for its actions. And perhaps more importantly, physicians were absolved of responsibility for what happened to the patient. Typically, the patient believes that his or her doctor provided high quality care and that the problem stemmed from pressures from Medicare.

Generally, patient letters did not identify incidents of poor quality of care provided *during* the hospital stay although four letters identified staff shortages as apparent. Most often, the incidents are related to perceptions of inferior quality because the hospitalization was too brief rather than because of what occurred during the hospital stay.

Major Issues

There are four major themes that continually surface in the reported incidents. While the specifics vary, the perceived effects on quality raise the following broadly defined policy issues:

(1) Patients are being discharged quicker and sicker.

One of the most prevalent issues concerning PPS is the implication for quality resulting from shortened stays. A decline in the number of days alone does not necessarily mean that quality of care has declined. Nor are all the reports of premature discharge alike. The most frequent complaints are from the patients who were sent home before *they* felt ready to leave the hospital, although the physician agreed to send them home and there was no reported negative health outcome. The second group are those patients released without home support or nursing home placement. The third type of incident is that where serious complications resulting in readmission or death result. Fortunately, the latter is the least frequent type of complaint we found.

[2]The sources follow this section.

The dramatic decline in length of stay supports the notion that PPS has altered the product provided to Medicare beneficiaries insofar as the convalescent component of the typical hospital stay has been reduced. The frequency of complaints about premature discharge is a result of the clash between the expectations of the elderly concerning the extent of benefits under Medicare and hospitals' management under PPS.

(2) Beneficiaries and providers have a number of misconceptions about Medicare benefits and about PPS.

A review of the incidents reported in the media shows there are a number of myths about how the system works.

Misconception #1: "Your DRG is Up"

The majority of patients who complained about the quality of their hospitalization said that the hospital representative or their doctor had told them that the number of days "paid for" by their DRG had expired and they had to leave the hospital. Reportedly, many hospitals have adopted the *mean as the maximum* number of days to be provided and have passed that misconception along to patients as justification for discharge.

Misconception #2: Patients Must Leave When the Hospital Tells Them To

Regardless of how the patients feel, if the patients' physician can be persuaded to discharge, patients believe they have to leave once they reach their "magic" day. No letters or incidents suggest that beneficiaries are aware of the safeguards within PPS to protect patients from abrupt discharge. Although hospitals have informed patients and medical staff of the changes in Medicare, most have not taken similar initiatives to tell their patients of rights of appeal under PPS. We found evidence that some terminally-ill patients and patients in unstable conditions were being discharged in an effort to reduce the cost per case. On the other hand, patients who have been informed of their rights and successfully exercised them do not write letters in defense of the system.

Misconception #3: A Patient Who Protests Will Be Responsible for the Entire Bill for the Hospitalization

Many incidents reflect a misunderstanding about Medicare disallowed days. Typically, beneficiaries are told that they have to leave or assume the costs of the additional days of care. Most patients, unaware of any rights to appeal, opt to go home in order to save additional out-of-pocket costs.

(3) Alternative care may not be available and/or accessible.

PPS is designed to encourage the use of alternative sites of care. How well does the system work? The primary issue related to quality is whether the alternative care provided is appropriate. Relatedly, are the alternatives both "available and accessible" to the elderly patients being discharged from hospitals? Is the supply and distribution of alternative sources of care adequate to meet the growing demand? And, if the care is available, is it also accessible (i.e., affordable)?

Is Appropriate Care Provided?—A number of reported incidents suggested that after-care was non-existent or inappropriate. As one consumer advocate reported, patients are released from hospitals to a "no care" zone. Patients may be discharged home without adequate support. Are alternative providers equipped to deal with this "sicker" group of patients? Perceptions concerning nursing homes and quality of the care provided in these facilities presents a serious stumbling block to the acceptance of nursing home care as an alternative.

Appropriateness of Outpatient Surgery for Some Patients.—A number of beneficiary letters raised questions about the appropriateness of requiring outpatient surgery for most patients for certain procedures like hernia repair or lens implant. Several elderly patients compare previous surgery with a recent outpatient surgical experience and find the latter "barbaric."

Availability of Alternative Care.—Three issues concerning the availability of alternative providers were raised: the shortage of nursing home beds; the ability of nursing homes to care for "sicker" patients; and the inadequacy of home care to meet the needs of patients and the need to supplement home care with extensive family and other support.

Accessibility of Alternative Care.—Nearly all the incidents point to the increased financial burden placed on beneficiaries who are discharged to the care of alternative providers, whereas prior to PPS *the care was provided in the hospital and paid for by Medicare*. Many of the letters indicate that this shift in costs is evident to the elderly consumer who is paying more and getting less.

In addition, the elderly person believes that Medicare will pay for most hospital care and that a supplemental insurance policy will cover the remaining physician charges. If Medicare disallows the cost, however, the supplemental policy will not pay either. This is a shattering discovery for beneficiaries who believe that they were fully protected.

(4) Inability of PROs to identify poor quality.

How effective are PROs in monitoring quality of care provided under PPS? The feeling is that PROs have concentrated on economic costs to the detriment of health care. Overutilization, it is claimed, has been the focus rather than addressing the issue of quality. Quality of care might be more effectively monitored if better communication among PROs, hospitals, and physicians was established. While several hospitals agreed that they are responding positively to PRO review, others maintain that their medical staffs resent the intrusion into their practices.

PPS has explicit incentives to encourage the provision of care outside of the hospital, but this care will then be provided *outside* the existing quality assurance mechanism. As PROs become more established and are armed with objective criteria, they will be better able to monitor quality of care in the inpatient setting. However, as the issues of concern to beneficiaries demonstrate, many possible problem areas are beyond the present scope of PRO review.

Conclusion

The evidence discussed here is illustrative of the kinds of problems that Medicare beneficiaries have experienced under PPS. Perceptions are valuable in identifying problems with PPS, however, the evidence presented is not sufficient to judge in what circumstances or to what extent quality of care has suffered under PPS. The points raised do identify very difficult policy questions that must be addressed concerning care for the Medicare beneficiaries—particularly the terminally ill and those without adequate support at home.

Sources of Incidents of the Perceptions of the Effects of PPS on Quality of Care

Interviews

Representatives from the following organizations have been interviewed:

American Association of Retired Persons
1909 K Street, N.W.
Washington, D.C. 20049

American Hospital Association
840 N. Lake Shore Drive
Chicago, IL 60611

Federation of American Hospitals
1111 19th Street, N.W., Suite 402
Washington, D.C. 20036

American Nurses' Association
2420 Pershing Road
Kansas City, MO 64108

Association of American Medical Colleges
1 Dupont Circle, N.W., Suite 200
Washington, D.C. 20036

Blue Cross and Blue Shield Association
676 N. Saint Clair
Chicago, IL 60611

National Association of Area Agencies on Aging
600 Maryland Avenue, S.W., Suite W208
Washington, D.C. 20024

Rush Presbyterian—St. Lukes Hospital
1753 West Congress Parkway
Chicago, IL 60612

Crittenton Hospital
1101 West University Drive
Rochester Hills, MI 48063

Mary Sherman Hospital
320 North Section
Sullivan, IN 47882

Herrin Hospital
201 South 14th Street
Herrin, IL 62948

Central Maine Medical Center
300 Main Street
Lewiston, ME 04240

Henryetta Medical Center
P.O. Box 1269
Henryetta, OK 74437

Peer Review Organizations

Arizona
Health Services Advisory Group, Inc.
301 West Osborn, Phoenix, AZ 85013
California
California Medical Review, Inc.
1375 Sutter Street, San Francisco, CA 94109
Connecticut
Connecticut Peer Review Organization, Inc.
999 Asylum Avenue, Hartford, CT 06105
Florida
Professional Foundation for Health Care, Inc.
2907 Bay to Bay Blvd., Tampa, FL 33606
Oklahoma
Oklahoma Foundation for Peer Review
601 NW Expressway, Oklahoma City, OK 73118
Wisconsin
Wisconsin Professional Review Organization
330 E. Lakeside Street, Madison, WI 53701

State Medical Societies

California
California Medical Association
44 Gough Street, San Francisco CA 94103
Florida
Florida Medical Association, Inc.
P.O. Box 2411, Jacksonville, FL 32203

Media Sources

News Sources Included in Automated Search

Dates: July 1, 1984 through June 30, 1985

Keywords: *Medicare* or *PPS* or *Prospective Payment System* and *Quality of Care*

NEWS	News file
AMSTAT	Update/The American States
AP	The Associate Press world, national, business and sports wire
ASAHI	Asahi News Service
BBCSWB	BBC Summary of World Broadcasts and Monitoring Reports
CDSP	The Current Digest of the Soviet Press
CENEWS	Central News Agency
CSM	The Christian Science Monitor
ERR	Congressional Quarterly Editorial Research Reports
EURNOR	Reuters North European News Service
FACTS	Facts on File World News Digest
INPRES	The Inter Press Service
JIJI	JiJi Press Ticker Service
KYODO	Kyodo English Language News Services
LAN	Latin American Newsletters
LIFE	Life
MACLEH	The MacNeil/Lehrer NewsHour
MAGRWK	Manchester Guardian Weekly
MCLEAN	Maclean's
NWEEK	Newsweek
NYT	The New York Times
PEOPLE	People
REUTER	Reuters General News Report
SPORTS	Sports Illustrated
TIME	Time
UPI	United Press International world, national, business and sports wire
UPST85	United Press International State and Regional Wires
USNEWS	U.S. News & World Report
WPAPER	World Paper
WPOST	The Washington Post
XINHUA	Xinhua (New China) News Agency

Newspapers Included in Library Search

Dates: January 1, 1984 through May 30, 1985

New York Times
Wall Street Journal
St. Louis Post-Dispatch
Los Angeles Times
Houston Post

New Orleans Times—Picayne
Chicago Tribune
San Francisco Examiner
Boston Globe
Washington Post
Detroit News
USA Today
CBS Transcripts

Other Newspaper Sources

Philadelphia Enquirer
Burlington Free Press (Vt.)
Peoria Journal-Star

Newspapers Contacted by Telephone

Huntsville Times, Alabama
Phoenix Arizona Republic, Arizona
Boulder Daily Camera, Colorado
Bridgeport Post, Connecticut
St. Petersburg Times, Florida
Champaign News-Gazette, Illinois
Sioux City Journal, Iowa
Wilkes-Barre Citizens Voice, Pennsylvania
Tacoma News Tribune, Washington
Stamford Advocate, Connecticut
San Diego Tribune, California
Peoria Journal-Star, Illinois
Evansville Press, Indiana
Manchester Union Leader, New Hampshire
Harrisburg Patriot-News, Pennsylvania
Louisville Courier Journal, Kentucky

Other Sources for Specific Incidents

Letter solicited by ASIM
AARP letters from beneficiaries
Quality Assurance Board of Florida
National Association of Area Agencies on Aging
Senate Special Committee on Aging
PRO letters from beneficiaries

PROFESSIONAL SOCIETY STUDIES

Several professional medical societies are monitoring the impact of the Medicare prospective payment system, including the impact of the system on quality of care. The most common methodological approach is the examination of incidents and opinions gathered by the societies through survey questionnaires.

These surveys are generally acknowledged by the societies themselves to be "unscientific" inasmuch as they record perceptions of problems and incidents rather than actual outcomes. In addition, it is not clear whether the formats of the questionnaires or the questions themselves have been tested for any bias they may contain.

Nevertheless, these surveys are valuable to the extent that they do register and record provider perceptions and concerns. The two societies whose work is discussed below believe that the survey results indicate a serious concern on the part of many physicians that PPS will have an increasingly negative impact on the quality of care, particularly in the form of premature discharges.

In addition to the surveys discussed below, other efforts will be undertaken by the following societies: The American Academy of Neurology, the American Academy of Otolaryngology-Head and Neck Surgery, the American Lung Association/American Thoracic Society, the Council of Medical Specialty Societies, and the American College of Cardiology.

The American Society of Internal Medicine

The American Society of Internal Medicine (ASIM) conducted an informal survey of its members to evaluate the effects of DRGs on patient care.

The survey tool was a questionnaire offered to members through the Society's newsletter and distributed at meetings from March of 1984 to September of 1985. As of mid-September 1985, 246 ASIM members out of approximately 20,000 had completed the survey. The respondents represented broad-based internists, subspecialists of internal medicine, and neurologists. While acknowledging that the survey was not "scientific," ASIM reported nearly 50 percent of the respondents viewed PPS pressures to discharge patients early as detrimental to the quality of patient care.

The American Medical Association (AMA)

The AMA DRG Monitoring Project is not a systematic survey, but rather an "information assessment activity" designed to ascertain the current impact of the PPS and to identify possible problem areas that might need further study. The project involves soliciting information through letters from practicing physicians. Requests for this information were conveyed to physicians through a variety of sources including the *AM News*, *JAMA*, and special letters to the chiefs of medical staffs in all hospitals covered by PPS. Several state medical associations, national medical specialty societies, and hospital medical staffs also promoted the project through their newsletters. AMA plans to continue this project at least through the PPS phase-in years. An annual report is prepared in December of each year.

The project was initiated in June of 1984 and as of August 31, 1985, 389 written responses had been received. The Association believes that these responses actually represent the opinions of over 7,800 physicians since several of the chiefs of staff conducted written surveys of their entire medical staffs. The 1985 December Report has been approved by the AMA House of Delegates.

The majority of responses contained in the report presented views on several issues and a number contained detailed supporting documentation. The areas of most common concern were:

- Quality of care,
- Costs of care,
- Length of stay,
- Admission/discharge policies, and
- Administrative relations.

Of the comments received concerning quality of care, 66 percent stated that the quality had deteriorated, while 34 percent stated that the quality had either improved or remained the same.

The report indicates that one major concern encountered by "many" physicians involves hospital stays in which a second patient condition or complication also requires treatment. The physicians reported that they had been discouraged from providing immediate treatment for a second condition, because the hospital may not receive additional reimbursement for a second procedure. The report provides no information, however, on how many physicians indicated this hospital practice.

The report also states that some physicians expressed concern over the effect that early discharges may have on the health care of patients. One physician expressed the fear that a number of patients who should have stayed in the hospital longer were "forced" into alternative health care facilities and were receiving a lesser quality of care than they would have in the hospital. The report further states that another concern involved administrative "pressure" to place limitations on laboratory tests and procedures and that "many" physicians reported that quality of care may eventually be affected by a decrease in the use of laboratory tests necessary for proper diagnosis.

A joint project of the AMA and The Johns Hopkins University, is attempting to determine "if changes in the hospitalization patterns of Medicare beneficiaries, and identifiable related changes in the quality of care rendered, can be attributed to the diagnosis related grouping (DRG)-based prospective payment system for hospitals."

Specific project objectives are: to identify the range of utilization changes that are likely to occur as a result of PPS; to identify the various quality of care effects which may occur as a result of changes in specific patterns of utilization and changes in the overall financial viability of hospitals due to PPS; and to develop a set of recommendations, including changes in the operation of the program and methods of monitoring program effects, in order to avert any future adverse health consequences and to improve the implementation of the system. The project will rely on a number of sources of data including the MEDPAR 20 percent sample file, hospital discharge abstract systems, PSRO/PRO data systems, and large scale national data bases maintained by various professional associations, such as the American Hospital Association, voluntary associations and government agencies.

The overall project, which is divided into three separate studies, will include analyses of admission rates, length of stay, intensity of or use of ancillary services, readmission rates, accessibility of sources, and case-mix changes.

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PROPAC RESEARCH ON QUALITY RELATED DATA BASES

To support development of the Commission's analytic agenda for quality of care research, ProPAC instituted an ongoing collection of information on data bases that may be relevant. The objectives of this activity are to document:

- Existing data bases that may be useful in quality studies;
- Primary data collection efforts resulting from quality of care research currently underway by various individuals or organizations; and
- Potential areas of unmet data needs for quality studies.

As part of this effort, two major sources of information regarding data bases were examined. These include the *Health Data Inventory—Fiscal Year 1983-84* (HDI) and the *Inventory of US Health Care Data Bases—1976-83* (IHCDB). The first source, HDI, was developed by the HHS Health Information Policy Council, an internal advisory group to the Secretary on health care data issues. The HDI contains a complete inventory of all ongoing and planned health data bases and related projects within HHS. It is currently being computerized and, therefore, the fiscal year 1985 version will not be available until after January 1986.

The second source, IHCDB, was produced by the American Hospital Association (AHA) under contract with the Health Resources and Services Administration (HRSA). This document contains information on a variety of national health care data bases, including those sponsored by organizations other than HHS. The AHA is conducting a follow-up evaluation of data bases developed through mid-1985. Updated and expanded data base abstracts are expected by Spring/Summer 1986.

Also undergoing review is a document published in October 1985 entitled *Medicare's Prospective Payment System—Strategies for Evaluating Cost, Quality, and Medical Technology*. This report, produced by the Office of Technology Assessment, provides a more focused and up-to-date presentation of data available for PPS-related studies. Specifically, it identifies data sources critical to evaluation of quality of care issues.

Initial review of these reference documents failed to reveal information on national data bases expressly developed for the study of quality of care. Nevertheless, existing data could: a) be combined to produce data bases useful for quality studies, or b) provide the foundation for additional ProPAC primary data collection, if necessary. These options will be considered in reviewing specific data requirements for the Commission's analysis of quality.

Additional ProPAC monitoring activities regarding potential data sources encompass: 1) the Urban Institute report entitled *Analysis of Data Bases for Studying the Impact of PPS on Long-Term Care* for the Office of the Assistant Secretary for Planning and Evaluation (ASPE); 2) statewide and commercial data bases that are not included in the IHCDB; 3) the existing linkage between Part A and B HCFA beneficiary data as well as other potential data base linkages (in order to support future quality studies that may encompass an entire episode of illness); and 4) quality studies undertaken by HHS, health care researchers, and other interested parties.

These efforts collectively are expected to:

- Enable ProPAC staff to respond to questions regarding data availability and the need for primary data collection;
- Ensure the use of existing data to the extent possible while avoiding duplication of data collection efforts by others;
- Indicate potential areas for Commission recommendation(s) regarding commitment of resources for collection of data unmet by existing sources; and
- Identify data collection efforts potentially suitable for collaboration with other organizations.

PEER REVIEW ORGANIZATIONS: MISSION AND FUNCTION

Peer Review Organizations (PROs) were established by Congress to assure that Medicare services are medically necessary, conform to professional standards and are delivered in an economical manner. This section presents an overview of the PROs' responsibilities focusing on aspects of the PROs' efforts directed to the issue of quality of care.

Legislative History and Background

Utilization review was first mandated by the original Medicare and Medicaid legislation of 1965. Its purpose was to assure that health care reimbursement by the federal government was provided only when necessary. It was subsequently determined, upon examination by the GAO and the Senate Finance Committee, that the system suffered from several inadequacies, including:

- The lack of coordination between Medicare and Medicaid review;
- Too little attention to the review of the quality of medical care;
- Insufficient physician participation in final review decisions; and
- Limited acceptance by physicians.

Congress, as part of the 1972 amendments to the Social Security Act, created the Professional Standards Review Organizations (PSROs) in an attempt, in part, to correct these inadequacies.

The PSRO program was based on two fundamental concepts of health care review: 1) physicians are the most appropriate persons to assess the quality of medical care delivered by physicians; and 2) local community based peer review and local standard setting are the most effective means of ensuring appropriate utilization of health care resources and facilities. The purpose of the program as applied to Medicare was to assure, with regard to the provision of health care services and items for which payment was made by the program, that:

- such services and items are or were medically necessary;
- the quality of such services meets professionally recognized standards of health care; and
- in case such services and items are proposed to be provided in a hospital or other health care facility on an inpatient basis, such services and items could, consistent with the provision of appropriate medical care, be effectively provided on an outpatient basis or more economically in an inpatient health care facility of a different type.

In 1982 Congress enacted as part of the Tax Equity and Fiscal Responsibility Act, the Peer Review Improvement Act which created the PRO program. Congress' stated intent was to redirect, simplify and enhance the cost-effectiveness and efficiency of the peer review of services reimbursed by Medicare.

The Social Security Amendments of 1983, establishing a prospective payment system for Medicare, amended section 1866(a)(1)(F) of the Social Security Act to specify that hospitals seeking reimbursement under the prospective payment system must enter into agreements with PROs by specified dates to review the following:[3]

- The validity of diagnostic and procedural information supplied by the provider;
- The completeness, adequacy, and quality of care provided;
- The appropriateness of admissions and discharges; and
- The appropriateness of care provided or proposed to be provided for which payment is sought on an "outlier" basis under the prospective payment system.

In addition, the amendments added section 1886(f)(2) of the Act to specify that the Secretary may deny payment or require the hospital to take corrective action, if a PRO provides the Secretary with documentation that a hospital has circumvented the prospective payment system through unnecessary admissions or other practices.

[3]The Deficit Reduction Act of 1984 further amended the Social Security Act to require that all hospitals, not just those receiving payment under the prospective payment system, must maintain an agreement with a PRO.

In some important respects, the PRO program is similar to the PSRO program; thus its stated purpose is to determine whether services provided under Medicare are reasonable, medically necessary, furnished in the appropriate setting, and are of a quality which meets professionally recognized standards. There are several important distinctions, however:

- Contracts between the Secretary and PROs are for an initial period of two years. They are renewable biennially, and generally speaking, are awarded to statewide review entities. PSROs received annual grants and as indicated above, were geographically organized on a more local basis.
- Contracts with PROs must specify objectives to be achieved over the contract period. An assessment of the organization's performance is to be measured against the objectives. The PSRO statute had no such contractual commitments.
- Sanctions of exclusion against providers or practitioners for violations of the statutory obligations automatically become effective 120 days after a PRO submits a recommendation for exclusion to the Secretary, unless the Secretary makes a decision to reverse within the 120-day period. Under the PSRO program, the Secretary had to act affirmatively to effectuate any sanction.

All 54 contracts between HCFA and the PROs were signed before the mid-November 1984 deadline established by Public Law 98-861.[4] Regulations governing the program were not issued until April 1985 (50 FR 15312) with an effective date of May 17, 1985. The areas covered by the regulation were: assumption of Medicare review functions and coordination with Medicaid; imposition of sanctions on health care practitioners and providers of health care services; acquisition, protection, and disclosure of PRO information; and reconsideration and appeals.

[4]In areas where an acceptable proposal was not received by a local physician organization, contracts were awarded to physician groups from another state. Vermont is covered by the New Hampshire PRO. In Idaho, the contract was awarded to a PRO established by Idaho Blue Cross, a fiscal intermediary. This is the only PRO run by a payer institution, but, nevertheless, physicians perform peer review.

Responsibilities of the PROs in the Initial Contract Period

In the PRO scope of work developed for the initial two year contract period of review, the focus of both utilization and quality of care review was on the attainment by the PROs of specific objectives established by HCFA. These objectives were heavily directed towards reducing unnecessary hospital admissions; quality of care improvement was viewed largely as a concomitant of reductions of procedures.

Each applicant for a PRO contract was required to propose one or more specific procedures or areas accompanied by a specific percentage or numerical goal of reduction for each "admission objective."

"Quality objectives" were also framed by HCFA, and, again, the potential contractor was required to propose at least one procedure and numerical goal for each objective. These objectives were to:

- Reduce unnecessary hospital readmissions resulting from substandard care provided during the prior admission.
- Assure the provision of medical services which, when not performed, have "significant potential" for causing "serious patient complications."
- Reduce avoidable deaths. This was subsequently changed to "reduce the risk of mortality associated with selected procedures and/or conditions requiring hospitalization."
- Reduce unnecessary surgery or other invasive procedures.
- Reduce avoidable postoperative or other complications.

In addition to the admissions and quality objectives, PRO contracts also required other review activities including:

- Preadmission/preprocedure review;
- Review of invasive diagnositc and therapeutic procedures, e.g., retrospective review of all cardiac pacemaker implantations;
- Review of transfers, readmissions within 7 days, and outliers;
- Other admission review including admission

review on 100 percent of cases under review for any reason; random sampling review; and
- Review and monitoring of hospital issued notices of noncoverage of continued stay in a PPS hospital. Such a notice might result in the shift of the financial burden to the beneficiary.

During the initial two year contract period the question was raised whether the scope of PRO review adequately addressed quality of care—despite the quality objectives pursued by the PROs. For example, concern had developed regarding the possibility and incidence of premature discharges under PPS. The quality objectives did not address this issue, and review of readmission within 7 days was thought to be, at best, an exceedingly indirect route to identifying and correcting the problem.

Critics suggested that the scope of review should be extended to the entire episode of care, and that the proper focus should be patient outcomes as measured over the entire spectrum of services provided. The suggestion was made, in other words, that the problem of premature discharge might stem not only from insufficient hospital services, but inadequate clinical management of the post-acute patient as well. The application of quality screening criteria to better identify quality concerns was also proposed as part of an increased emphasis on quality review.

Responsibilities of the PROs in the Second Contract Period

In the fall of 1985 HCFA issued for comment a proposed draft scope of work for the second contract period. The final RFP was issued in January 1986, and the scope of work differed from that of the original two year contract in several aspects.

Quality of Care Review

The most significant difference appears to relate to the review of quality of care. The overall concept of attaining quality improvement by the achievement of certain objectives is retained. The focus, however, has shifted from the application of predetermined quality objectives to the reduction of adverse outcomes, including premature discharges. These outcomes and target reductions are to be determined by the use of generic quality screening, PRO area provider-specific data on outcome or statistical outliers furnished by HCFA, and PRO area DRG-specific data on outcome or statistical outliers (also furnished by HCFA). The scope of work, in effect, establishes three categories of target reductions for the elimination of adverse outcomes: the first and second focuses on providers and/or practitioners using generic screens and provider-specific outcome data; the third focuses on DRGs.

With regard to the first category, a baseline is first established by applying generic quality screens, provided by HCFA, to a 3 percent random sample of all reviews performed after the contract effective date. The PRO analyzes the results from the first 90 days of the application of the generic screens and establishes a baseline by the 120th day. The baseline consists of levels of occurrence of the issues identified by using the generic quality screens projected to the PRO area.

The PRO also proposes target reductions and intermediate milestones by the 120th day; by the 150th day, it must reach agreement with HCFA on the baseline, target reductions and intermediate milestones. The screens, constructed by HCFA, include over 31 indications of adverse outcomes grouped under the following 6 broad concerns:

- Adequacy of discharge planning,
- Deaths,
- Nosocomial infections,
- Unscheduled return to surgery within same admission for same condition as previous surgery or to correct operative problem (excluding "staged" procedures), and
- Trauma suffered in the hospital

The second category of adverse outcome target reductions uses as a baseline PRO area provider-specific data on outcome or statistical outliers furnished by HCFA. HCFA has developed a linear regression model to identify patterns of utilization in terms of numbers of discharges per acute care bed and patterns of outcomes in terms of inpatient mortality rates. Hospitals were identified as high or low statistical outliers if their ac-

tual experience in 1984 differed markedly from that predicted by the model. Results from the model were adjusted for differences in the demographic composition of providers' Medicare patients and for case mix.

The PRO uses this provider-specific data to propose target reductions and intermediate milestones for the providers on HCFA's list. However, the PRO may substitute other providers for those indicated by HCFA. In order to do this, it must demonstrate to the satisfaction of HCFA that the HCFA-identified outliers are not problems in the PRO area or that the PRO-identified providers have problems which have a greater need for resolution. HCFA specifically cautions that the listing of a hospital as a statistical outlier does not necessarily indicate the presence of problematic admission patterns or unsatisfactory quality of care since the model did not take into account all possible causative factors of an outlier. Conversely, the absence of any provider from the list does not imply that there are no aspects of medical care at that hospital which do not merit scrutiny and improvement.

The PRO, in its proposal, must verify which hospitals identified by HCFA as statistical outliers merit, on the basis of the PRO's data or knowledge, intensified review. Intensified review refers in general to a close scrutiny of a problem area; for example, it might include 100 percent review of a department's or a physician's cases. Such review is required for high outliers, which are those providers that exhibit behavior potentially resulting in impaired quality of care. Means and activities must be proposed to address the causes of the adverse outcomes and meet the target reductions.

The third category of adverse outcome target reductions is that which focuses on the DRGs. The baseline for target reductions is the PRO area DRG-specific data on outcome or statistical outliers furnished by HCFA. HCFA selected nine DRG categories from a list prepared by a clinical panel of physicians as being of particular medical interest. HCFA then examined, through linear regression techniques, Medicare discharges per Medicare-eligible person in the states and Medicare inpatient mortality rates for each PRO area for the nine DRG categories in 1984. The final HCFA list specifies those conditions and DRGs for which the PRO area departed markedly from national norms, after allowing for differences in the demographic characteristics of the area's Medicare patients. A DRG appears on the list if the difference between the PRO's actual experience and that predicted by the statistical model could have occurred by chance alone only with a probability of 10 percent or less (90 percent significance level) or 5 percent or less (95 percent significance level).

The review of the outlier DRGs is similar to that of the review of outlier providers in that it is the responsibility of the PRO to verify which DRGs on the list merit intensified review, on the basis of the PRO's data analysis and knowledge of the medical events and practices in its jurisdiction. Intensified review is required for those DRGs for which discharge and/or mortality rates appear to be inappropriate and suggestive of inadequate quality of care.

The PRO also has to provide documentation to support a proposal which does not include intensified review for all specific DRGs on the list. It may also select other conditions for intensified review on the basis of its experience in the preceding contract period.

Further steps have been taken regarding quality review, in addition to the approach of eliminating adverse outcomes through target reductions described above. These additional steps include discharge review, broad generic quality screening, review of readmission within 15 days, and the establishment of community outreach programs.

The objective of the discharge review is the detection of premature discharges. These are defined in the scope of work as discharges where, in the opinion of the PRO physician reviewer, the patient was not medically stable and/or where discharge was not consistent with the patient's need for continued acute hospital care. Every case under PRO review is to be further reviewed against discharge criteria approved by HCFA. In accordance with regulations and HCFA instructions, the PRO will deny payment if a discharge is found

to be premature. If a "gross and flagrant" episode or a pattern of premature discharge occurs, the PRO is to initiate sanction activity.

Generic quality screening also is to be applied to every case under PRO review for any reason, including those cases being reviewed under the target reduction approach. The PRO is required to use the quality screens provided by HCFA. These are the same screens used by the PRO for the adverse outcome target reductions. The PRO determines whether quality issues exist and initiates appropriate interventions for identified quality problems.

One aim of the review of readmission within 15 days of discharge is the detection of readmission resulting from premature discharge. Another aim is the detection of readmission for care that, pursuant to professionally recognized standards of health care, should have been provided during the first admission.

Lastly, the PRO is directed to conduct programs to inform beneficiaries about Medicare PRO review. The programs are to be geared towards educating beneficiaries about the types of PRO review and their purpose, and informing the beneficiaries of their Medicare rights. The PRO is expected to describe the methods it will use to implement programs such as hotlines, seminars, and the providing of information brochures.

These multiple approaches to quality review in the new PRO scope of work indicate much greater emphasis on PRO quality review than existed before. There has not as yet, however, been any expansion of review beyond the inpatient setting.

Utilization Review

Utilization review no longer calls for specific pre-established narrow utilization or admission objectives. The review process is similar to that for quality review. The PROs are required to reduce unnecessary admissions and procedures focusing on provider and practitioners by using as a baseline PRO area provider-specific data on statistical outliers furnished by HCFA. They are further required to reduce unnecessary admissions and procedures focusing on DRGs by using as a baseline PRO area DRG specific data on statistical outliers furnished by HCFA. The PROs are to propose target reductions and intermediate milestones, identify high and low outliers in the provider and DRG categories and subject high outliers to intensified review.

Other review activities of a utilization nature have not, for the most part, changed substantively. There is now a simple 3 percent random sample review which replaces a more complicated formula. Preadmission review of 5 procedures proposed by the PRO has been replaced by 4 procedures plus 100 percent preadmission review of pacemakers. There is no longer any retrospective review of pacemakers; and transfers and outliers have reduced levels of review. DRG 088 (Chronic Obstructive Pulmonary Disease) has been added to DRG focused review; the percentage of cases for intensified review has been changed. Medicare Code Editor review has remained the same.

Further, DRG validation is still required, and the PRO must know and understand HCFA coverage policies in order to be able to identify noncovered items or services. PRO activities regarding denials and reconsiderations, and the PRO role in the sanction process, all provided for by regulation, have not been affected by the new PRO scope of work.

MEDICARE BENEFICIARY APPEALS PROCESS

Summary

This section of the appendix outlines the appeals process provided for beneficiaries under Part A and Part B of Medicare. A brief review of eligibility, coverage, and exclusions from coverage is also included to present a more complete picture of the spectrum of issues that can be raised and determined in the payment decision and appeals process. Any of the eligibility, coverage, and exclusion issues discussed could be the basis of an initial payment denial, and subsequent review and appeal.

The overall appeals process is a complex patchwork of differing procedures. Broadly stated, with regard to Part A, the issue being appealed determines which of four categories of appeal is put in motion. In the first category are those issues pertaining to the coverage and the amount of benefits to be paid to entitled individuals under Part A of Medicare. These determinations are made by the intermediaries based on HCFA regulations and manual directives.

The second category involves a determination regarding issues that also have a direct effect on the amount of benefits paid but which, with regard to inpatient hospital services, fall within the jurisdiction of the PROs and are subject to a somewhat different appeals process: this is the determination regarding the medical necessity of the services and whether the services were custodial. If a service is determined by a PRO not to be (or have been) medically necessary or of a custodial nature, Medicare payment is denied.

The third type of determination is also directly related to medical necessity and custodial care. It involves a process, called waiver of liability, by which liability for actual payment may be waived for either a beneficiary or a provider, despite a denial of payment determination. Again, for inpatient hospital services, this determination is made by the PROs.

The fourth category is a determination relating to an individual's entitlement to Part A benefits. This determination is made by the Social Security Administration.

The appeals process for Part B falls into categories similar to that of Part A. The PROs, however, do not currently play a role in the Part B review process.

This summary focuses on the second category of Part A appeals, which is one aspect of this process which is of direct concern to the Commission. This aspect is the right granted to a beneficiary who is still in the hospital to appeal to the PRO a determination by the hospital denying continued inpatient care and charging the beneficiary for further inpatient services. The right to appeal does exist, but the problem is that beneficiaries may not know of or understand the right.

PRO Reconsideration and Appeal Process

Congress has required the PROs to make determinations as to whether the services rendered to the beneficiary are medically necessary and appropriate and do not constitute custodial care. Congress has further directed the Secretary to enter into contracts with the PROs to effectuate this requirement. The fiscal intermediary and HCFA still have authority to make these determinations but defer to the authority of the PRO (except under unusual circumstances).

However, in the preamble to the PRO regulations published in April 1985, HCFA made it clear that the PRO's determination does not supercede HCFA's authority to enforce the coverage provisions of the statute. HCFA acknowledged that it is bound by a PRO determination with respect to a medical necessity issue but that it will continue to make coverage determinations on other bases. These include whether the service was statutorily excluded. Thus, although a service (e.g., heart transplantation) may be medically necessary, it might not be a service covered under Medicare.

The process provided for reconsideration of and appeals from a payment denial made by a PRO is illustrated in the diagram prepared by HCFA that appears later. The details of this process are presented later in this section. In brief, the PRO makes an initial denial determination involving

the issues of medical necessity, appropriateness of the inpatient setting in which services were furnished, and whether the care was custodial.

The PRO must deliver the notice of denial to beneficiaries in a facility, such as a hospital, nursing home, or must mail it to those no longer in a facility. Notice must also be sent to the attending physician, provider, and the fiscal intermediary. The required time period for the notice differs according to the type of review, e.g., preprocedure review, preadmission review.

The Medicare beneficiary, provider, and physician are all entitled to a reconsideration of the denial, but the Social Security Act gives a right of further appeal solely to the beneficiary. The beneficiary is entitled to a hearing if the amount in controversy is at least $200 and to judicial review if the amount in controversy is at least $2000.

Hospital Denial of Coverage for Continued Inpatient Care

One aspect of this process has already proven to be problematic. The regulations give a hospital the authority to deny continued inpatient care and to charge the beneficiary for such care if the hospital has determined, with the concurrence of either the attending physician or the PRO, that further services are not medically necessary. There is an established procedure provided by regulation that the hospital must follow in rendering its denial of continued coverage determination. Built into this procedure is the right of the beneficiary to challenge the denial. However, the procedure, while appearing reasonable on paper, has come under fire as inadequate in practice due chiefly to a growing concern that beneficiaries have not been aware of this right of appeal.

The procedure provides that the initial denial determination is made by the hospital. However, the PROs can enter into the process at three points: (1) if requested to concur in denial because the attending physician refuses; (2) if asked by the hospital to make a formal determination because the beneficiary has remained in the hospital; or (3) if requested by the beneficiary to reconsider its formal denial determination. The hospital's initial denial notice must inform the beneficiary in writing that:

- It is the hospital's determination with the concurrence of the attending physician or the PRO, that the beneficiary no longer requires inpatient hospital care;
- The patient will be liable for the hospital's customary charges for continued stay, beginning with the third day after receipt of the notice;
- If the patient remains in the hospital after he becomes liable, the PRO will make a formal determination of the medical necessity and appropriateness of the hospitalization;
- This formal determination is subject to a reconsideration at the request of the patient, hospital, or attending physician; and
- Any moneys for continued stay collected by the hospital will be refunded by the hospital, if a finding is subsequently made that the patient required continued inpatient hospital care.

In addition to this procedure, the PROs are responsible for monitoring hospital notices for denial of continued stay. The monitoring is done to ensure that the notices are correct and do not mislead the beneficiary or misstate the authority or responsibility of the hospital in issuing the notice.

Specifically, the notice cannot contain:

- Statements and implications that the decision to terminate the inpatient services was not made by the hospital, but by someone else, e.g., by Medicare;
- Inaccurate determination of beneficiary responsibility for payment;
- Inappropriate grace period given to the beneficiary;
- An implication that there is a limit on the number of days "allowed" by Medicare for a DRG.

There have been many criticisms of this system and some of them are discussed at greater length in a subsequent section. Two, however, are central. First, the notice is not required each time a person is discharged but rather when the hospital has determined that it will start charging the

beneficiary. Thus, even if a beneficiary fears that his discharge is medically inappropriate he will not know of his rights unless the hospital itself goes the extra step and informs him of its decision to begin charging him.

Second, while a requirement of written notice might have been promulgated in the best interests of the beneficiary, there is no way of determining, through the usual avenue of research, what is *said* to a beneficiary. It is feared that beneficiaries continue to be told that their DRGs or their coverage has "run out."

Despite the current uncertainty about the dimensions of this problem, the deficiencies are real and can be resolved by providing the beneficiary with timely information. Thus, the Commission in this year's April report recommends that a notice or information bulletin be given to all beneficiaries when they are admitted to a hospital. The notice should state in understandable language the rights of beneficiaries while in the hospital and should warn them concerning misleading discharge information.

Medicare Part A

Eligibility

Individuals are eligible for Part A Medicare benefits if they:

- Are age 65 or over, and are eligible for social security or railroad retirement benefits; or
- Are under age 65 and have been entitled for not less than 24 months to social security benefits or railroad retirement benefits on the basis of disability; or
- Have end-stage renal disease.

Coverage

The benefits provided to an individual under Part A of Medicare consist of entitlement to have payment made on his behalf for inpatient hospital care, post-hospital nursing facility care, home health services and hospice care.

Inpatient Hospital Care

There are up to 90 days in each benefit period. A new benefit period begins after a beneficiary has not been an inpatient in any hospital or skilled nursing facility for at least 60 consecutive days. Each beneficiary also has a non-renewable lifetime reserve of 60 days of inpatient hospital services that he may draw upon whenever he is hospitalized for more than 90 days in a benefit period. For the first 60 days of the 90-day benefit period, Medicare pays the hospital for all covered services furnished the beneficiary except for a deductible which is the beneficiary's responsibility. For the next 30 days, Medicare pays for all covered services except for a daily coinsurance amount paid by the beneficiary.

The term "inpatient hospital services" includes the following services furnished to an inpatient of a participating hospital or a qualified hospital in the case of emergency services or services in foreign hospitals:

- Bed and board;
- Nursing services and other related services;
- Use of hospital facilities;
- Drugs, biologicals, supplies, appliances, and equipment;
- Certain other diagnostic or therapeutic services; and
- Medical or surgical services provided by certain interns or residents-in-training.

Post-hospital Skilled Nursing Facility Care

Up to 100 days of SNF care are available in each benefit period after discharge from a hospital after a stay of at least 3 consecutive calendar days, not counting the day of discharge. For the first 20 days Medicare pays for all covered services. The beneficiary pays a daily coinsurance for the 21st through 100th day.

The term "post-hospital SNF Care" includes the following services furnished to an inpatient of a participating SNF or a hospital that has a swing-bed approval:

- Nursing care provided by or under the supervision of a registered professional nurse;
- Bed and board in connection with the furnishing of that nursing care;
- Physical, occupational, or speech therapy;
- Medical social services;
- Drugs, biologicals, supplies, appliances, and equipment;
- Certain medical services provided by an intern or resident-in-training;

- Certain other diagnostic or therapeutic services; and
- Other services that are necessary to the health of the patient and are generally provided by SNFs.

Home Health Visits

Medicare pays for 100 visits within one year after the later of (1) the individual's most recent discharge from a hospital, following a stay of at least 3 consecutive days, or (2) the individual's most recent discharge from a SNF.

The term "home health services" includes the following items and services:

- Part-time or intermittent nursing care provided by or under the supervision of a registered professional nurse;
- Physical, occupational, or speech therapy;
- Medical social services provided under the direction of a physician;
- Part-time or intermittent services of a home health aide;
- Medical supplies (other than drugs and biologicals) and the use of medical appliances; and
- In the case of a home health agency that is affiliated or under common control with a hospital, medical services provided by an intern or a resident-in-training of that hospital under an approved teaching program.

Hospice Care

In order to be eligible to elect hospice care an individual must be entitled to Part A of Medicare and not expected to live for more than 6 months. The beneficiary may elect to receive hospice care for two periods of 90 days and one subsequent period of 30 days. If a beneficiary elects to receive hospice care, he must choose to receive his care from a hospice program and give up his right to receive most other Medicare benefits. However, the election is revocable.

The hospice care benefits covered by Medicare include the following services and supplies:

- Nursing care provided by or under the supervision of a registered professional nurse;
- Medical social services provided by a social worker under the direction;
- Physician's services;
- Counseling services;
- Short-term inpatient care provided in a participating hospice inpatient unit or a participating hospital, SNF, or ICF;
- Medicare appliances and supplies, including drugs and biological: only drugs that are used primarily for the relief of pain and symptom control related to the individual's terminal illness are covered;
- Home health aide services; and
- Physical therapy, occupational therapy and speech language pathology services provided for purposes of symptoms control or to enable the individual to maintain activities of daily living and basic functional skills.

Exclusions From Coverage

Congress, in the Social Security Act, directly addressed the issue of what services would not be paid for under both Part A and B. In total there were approximately 14 entries indicating types of exclusion. The entries fell roughly into three broad categories. More than half of the entries pertained not to specific excluded services but to any services that were covered, in the beneficiary case, by some other party, such as a state or local government, the Veterans Administration, or under a workers compensation law or a liability insurance policy such as automobile liability coverage.

In a second category of exclusion from payment under both Part A and B, Congress explicitly indicated certain services that would not be covered. These include routine physical checkups, eyeglasses, hearing aids, immunizations, orthopedic shoes, certain kinds of foot care, personal comfort items, and cosmetic surgery.

The last group, but perhaps the most critical, under which most denials are probably made, is that which calls for judgment on the part of some entity, such as an intermediary, HCFA, or the PROs, as to items or services that are reasonable or necessary for the treatment of illness, and what services constitute merely custodial care.

The statute provides that no payment shall be made for any expenses incurred for items or services which are not reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member. That statute states that this includes:

- hospice care that is not reasonable and necessary for the palliation or management of terminal illness;
- the use of pneumococcal vaccine or hepatitis B vaccine if it is not reasonable and necessary for the prevention of illness; and
- clinical care items and services that are not reasonable and necessary to carry out the purposes of the Prospective Payment Assessment Commission's research and experimentation endeavors, as provided by law Section 1886(e)(6).

It is under this broad category that HCFA has developed and maintains a list of particular procedures and items, such as durable medical equipment, that are either covered or not covered under Part A and Part B—accompanied in some instances by an indication of particular circumstances under which the procedure, item, or device might be covered.

Procedures addressed under Part A as covered under certain restricted circumstances, include ultrasonic surgery, vitrectomy, and induced lesions of nerve tracts. Procedures not covered include acupuncture, heart transplants, and carotid body resections. The screening list for durable medical equipment included in both the Medicare Carriers (Part B) and Part A Intermediary Manual include coverage denial for such equipment as adjust-a-beds, autolifts, bathtub seats, and electric hospital beds.

Determination, Reconsideration and Appeals Process of Part A Benefit Claims

When a bill containing a request for payment for Part A benefits is submitted to the intermediary by a participating provider of services, the intermediary approves, denies, or partially denies the claim. If the claim is paid or partially paid, the Administration sends the beneficiary a utilization notice. In instances where the beneficiary has requested payment, but no payment or only partial payment is made, a disallowance letter is sent by the intermediary to the beneficiary.

As indicated in the introductory summary the appeals process for disallowance or denial under Part A is not uniform and the particular issue determines which of several appeals processes is applicable. The determinations made regarding Part A beneficiary claims can perhaps best be understood as representing four different types or categories with their own review procedures and appeal mechanisms. In the first category are those issues generally pertaining to the coverage and the amount of benefits to be paid to entitled individuals under Part A as opposed to the issue of entitlement.

The second category involves a determination regarding issues that also have a direct effect on the amount of benefits paid but which now with regard to inpatient hospital services fall within the jurisdiction of the PROs and are subject to a somewhat different appeals process: this is the determination regarding the medical necessity of the services and whether or not the services were custodial.

The third type of determination is directly related to that just set forth, medical necessity and custodial care. It involves a process, called waiver of liability, by which liability for actual payment may be waived, notwithstanding a denial of payment determination. Again, for inpatient hospital services, this determination is made by the PROs.

The last is a determination relating to an individual's entitlement to Part A benefits. This determination is made by the Social Security Administration.

The following is an explanation of all four categories with an emphasis on that aspect of Part A coverage that pertains specifically to inpatient hospital services.

Determinations Regarding Benefit Coverage and Amount of Payment

Initial Intermediary Determination.—Under this category an initial determination by the in-

termediary with respect to a beneficiary request for payment for Part A benefits includes the following types of issues:

- Coverage of items and services furnished;
- The amount of an applicable deductible;
- The application of the coinsurance feature;
- The number of days of inpatient hospital benefits utilized during a spell of illness or for purposes of the inpatient psychiatric hospital 190-day lifetime maximum;
- The number of days of the 60-day lifetime reserve utilized for inpatient hospital coverage;
- The number of skilled nursing facility days utilized;
- The number of home health visits utilized;
- The physician certification requirement;
- The request for payment requirement;
- The beginning and ending of a spell of illness;
- The medical necessity of services (made by the PROs for inpatient hospital services);
- A determination with respect to the waiver of liability provisions (made by the PROs for inpatient hospital services);
- Any other issues having a present or potential effect on the amount of benefits to be paid under Part A, including a determination as to whether there has been an overpayment or underpayment of benefits paid under Part A, and if so, the amount; and
- Whether a waiver of adjustment or recovery is appropriate when an overpayment has been made with respect to an individual.

The initial decision is final and binding upon the beneficiary unless it is reconsidered or revised.

Reconsideration.—A beneficiary has a right to a reconsideration of the initial intermediary determination regardless of the amount in controversy. The request for reconsideration must be filed within 60 days of receipt of the notice of initial determination at an office of the Social Security Administration or the Health Care Financing Administration (HCFA).

Administrative Hearing.—A beneficiary has a right to a hearing regarding an initial determination if:

- the initial determination has been reconsidered by the Health Care Financing Administration;
- the amount in controversy is $100 or more.

The hearing is held before an administrative law judge of the Office of Hearings and Appeals which is one of the major components of the Social Security Administration. The Office is administratively responsible to the Commissioner of Social Security and, by direct delegation from the Secretary of Health and Human Services, derives and has final authority relating to the holdings of hearings, the rendering of decisions, and the review of decisions in connection with administrative appeals from reconsideration determinations made under title II (old-age, survivors, and disability insurance) and Part A of title XVIII (Medicare) of the Social Security Act.

The next step is to request review by the Appeals Council of the Office of Hearings and Appeals. The Appeals Council, located in Washington, D.C., is composed of ten members, including a Chairman and Deputy Chairman. The Director and Deputy Director of the Office of Hearings and Appeals serve as the Chairman and Deputy Chairman, respectively. If the request is denied, the beneficiary may nevertheless proceed to court review.

Judicial Review.—A beneficiary may obtain court review of a final decision of the administrative law judge or the Appeals Council where the amount in controversy is $1000 or more by filing a civil action in a district court of the United States within 60 days after the mailing to him of the decision of the Appeals Council on the merits of the appeal or the Council's decision to deny review. The action may be brought in the federal district court in which the beneficiary resides or has his principal place of business or in the District Court of the United States for the District of Columbia.

PRO Determinations

Medical Necessity Determination Appeals Process.—The fiscal intermediary and HCFA still have authority under the regulations to determine whether the services rendered to the beneficiary

were medically necessary and appropriate and did not constitute custodial care. However, Congress in Section 1862(g) of the Social Security Act has required the Secretary in making these types of determinations to enter into contracts with the PROs, and separately, in Section 1151 through Section 1154, has required the PROs to make determinations of medical necessity and custodial care for some or all of the services performed in its geographic area of responsibility.

The Department's interpretation of the statute and present policy is to defer to the authority of the PROs with regard to these responsibilities. Thus, the PRO Manual provides that if an item or service identified by the fiscal intermediary requires a medical necessity determination, it is to be referred to the PRO for review. Further, if the item or service is to be denied, a denial notice is to be issued by the PRO.

HCFA, however, made it clear in the preamble to the PRO regulations, published in April 1985, that the PRO's determination did not otherwise supercede HCFA's authority to enforce the coverage provisions of the statute. It acknowledged that it was bound by a PRO determination with respect to a medical necessity issue but that it would continue to make coverage determinations on other bases, including whether the service was a statutorily excluded service. Thus, although a service may have been medically necessary, it might be a service that is not covered under Medicare.

The ramification of this split responsibility is that the review and appeals process differs from that of the intermediaries' determinations in the following manner.

- First, a beneficiary's appeal of a PRO's initial decision goes, not to HCFA, but back to the PRO itself.
- Secondly, the amounts in controversy required for administrative and judicial appeal differ from those applicable to intermediary determinations. As with the latter, they are also statutorily provided but are $200 and $2000 respectively instead of $100 and $1000.
- The beneficiary also has a right to PRO review of a coding change resulting from PRO DRG validation. However, this review is limited and governed by yet different rules. It will be treated separately after the following description of the appeals process for PRO determinations regarding medical necessity, appropriateness, and custodial care.

Initial Decision (See Attachment II for HCFA diagram of PRO appeals process).—The PRO makes an initial denial determination involving the issues of medical necessity, appropriateness of the inpatient setting in which services were furnished, and whether or not the care was custodial. Notice of a denial must be sent to the beneficiary, physician, provider, and the fiscal intermediary.

The notice must be delivered to beneficiaries in the facility or mailed to those no longer in the facility, within the following time periods:

- For admission review when performed while the patient is still in the facility by the first working day after the initial denial determination;
- For continued stay review (e.g., outliers in facilities under a prospective payment system)—by the first working day after the initial denial determination if the beneficiary is still in the facility, and within three working days of the initial determination if the beneficiary has been discharged;
- For preprocedure review—before the procedure is performed;
- For preadmission review—before admission;
- If identification as a Medicare program patient has been delayed but medical review has been completed—within three working days of identification as a Medicare beneficiary;
- For retrospective review (i.e., review conducted after services are provided to a patient), excluding DRG validation and post-procedure review—within three working days of the initial denial determination (this does not include the time involved in discussing proposed initial denial determinations with the attending physician); and
- For post-procedure review—within three working days of the initial denial determination.

PRO Reconsideration.—A Medicare beneficiary who is dissatisfied with a PRO initial denial

determination that services furnished or proposed to be furnished are not reasonable, necessary, or delivered in the most appropriate setting, is entitled to a reconsideration by the PRO that made the initial denial determination. The provider and physician are also entitled to a reconsideration. The reconsideration reviewer must be a specialist in the type of services under review, but cannot be the individual who made the initial determination.

A request for reconsideration must be filed within 60 days after the receipt of the notice of the initial denial. A request for an expedited reconsideration of a preadmission denial determination must be submitted within three days after receipt of the notice of the initial denial determination. The written notice of the PRO's reconsideration determination must be sent to the beneficiary within the following time limits:

- Within 3 working days if the beneficiary is still an inpatient in a hospital;
- Within 3 working days if the determination was a preadmission denial;
- Within 10 working days if the beneficiary is an inpatient in a SNF; and
- Within 30 working days if the beneficiary is no longer an inpatient in a hospital or SNF.

Hearing.—Only the beneficiary has appeal rights beyond reconsideration regarding a denial of payment decision. The statute itself does not give further appeal rights to providers or practitioners. The beneficiary must file a request for a hearing within 60 days of receipt of the notice of the PRO reconsideration. The amount in controversy must be at least $200.

The hearing is held before an administrative law judge of the Office of Hearings and Appeals. The next step is to request review by the Appeals Council of the Office of Hearings and Appeals. However, if the request is denied, the beneficiary may nevertheless proceed to court review.

Judicial Review.—The beneficiary may obtain judicial review of an Appeals Council decision, or the decision of an administrative law judge by filing a civil action in federal court within 60 days after the date the beneficiary received notice of the decision of the Appeals Council on the request or its decision to deny review. The amount in controversy must be $2000 or more.

Problem of Denial of Coverage for Continued Inpatient Services.—With regard to the appeals process just discussed, one aspect has already proven to be problematic—the situation of an inpatient who, in the judgment of either the PRO or the hospital, no longer requires inpatient hospital care. The issue has arisen as to whether the appeals process, specifically at the reconsideration stage as discussed above, is adequate to prevent the phenomenon of premature discharges.

A request for reconsideration of a PRO denial decision by a beneficiary who is still an inpatient in a hospital could arise in two ways: (1) a PRO, in reviewing a specific case concurrently with respect to any of its review responsibilities, determines that the beneficiary no longer requires inpatient hospital care, and the beneficiary requests a reconsideration; or (2) the hospital itself determines that the beneficiary no longer requires inpatient hospital care and informs the beneficiary.

There is an established procedure provided by regulation that the hospital must follow in rendering its denial of continued coverage determination. The required process is set forth first, followed by the criticisms that have been articulated.

The Process.—A hospital may issue a denial of continued coverage during a stay if the hospital determines that the beneficiary no longer requires inpatient hospital care. The phrase, "inpatient hospital care," includes cases where a beneficiary needs a SNF level of care. This also means that a hospital may find that a patient awaiting SNF placement no longer requires inpatient hospital care because either a SNF-level bed has become available or the patient no longer requires SNF-level care.

The hospital must obtain the agreement of the attending physician. If the attending physician does not agree, the hospital may request immediate review of the case by the PRO. Concurrence by the PRO serves in lieu of the physician's agreement.

The hospital must notify the beneficiary in writing that:

1. It is the hospital's determination with the concurrence of the attending physician or the PRO, that the beneficiary no longer requires inpatient hospital care;

2. The patient will be liable for the hospital's customary charges for continued stay, beginning with the third day after receipt of the notice;
3. If the patient immediately requests a review of the notice or remains in the hospital after he/she becomes liable, the PRO will make a formal determination of the medical necessity and appropriateness of the hospitalization (in the case of a hospitalized patient's request, the PRO must respond within three working days of its receipt);
4. This formal determination is subject to a reconsideration at the request of the patient, hospital, or attending physician; and
5. Any moneys for continued stay collected by the hospital will be refunded by the hospital, if a finding is subsequently made that the patient required continued inpatient hospital care.

In addition to this procedure, the PROs have the responsibility to monitor hospital notices for denial of continued stay. The hospital must identify all such cases to the PRO. In turn, the PROs are required to review a monthly random sample of the denial notices to assure that they are correct and do not mislead the beneficiary or misstate the authority or responsibility of the hospital in issuing the notice. Specifically, the notice cannot contain:

1. Statements and implications that the decision to terminate the inpatient services was not made by the hospital, but by someone else, e.g., by Medicare;
2. Inaccurate determination of beneficiary responsibility for payment;
3. Inappropriate grace period given to the beneficiary;
4. An implication that there is a limit on the number of days "allowed" by Medicare for a DRG.

Criticisms.—The hospital denial of coverage process as set forth above has evoked criticisms by a number of beneficiary rights organizations. As one such organization, the National Health Law Program, testified before a Congressional hearing that patients' reports usually assume a:

> . . . remarkably similar form: some hospital representative has told the patient and/or relative that they must leave in short order (commonly within a day). Commonly they are told that their Medicare coverage has 'run out.' The communications are by word-of-mouth; written 'notice' is rarely involved.

The testimony further indicates that in cases where written notice was given, the notices were defective in various respects. For example, they did not clarify appeals rights and failed to advise patients of their right to two additional grace days.

Beneficiary organizations also criticize the fact that the notification process is *not* required in all cases where a hospital seeks to discharge a beneficiary, but applies only where a hospital expressly notifies the beneficiary that it will seek to charge a beneficiary for a continued stay. Hospitals, it is argued, should be required to give such notice *whenever* they seek to discharge a beneficiary; such a requirement would not only directly benefit beneficiaries but would also produce a valuable data base from which Congress, DHHS, and the PROs would be more accurately informed about how PPS was actually operating.

Finally, the beneficiary organizations believe that the time limits for PRO reconsideration of an appeal from a beneficiary who is still an inpatient are detrimental to the beneficiary. As seen above, the regulations provide that the PRO must send written notice to the beneficiary within 3 working days after the PRO receives the request from a beneficiary in the hospital. Under these circumstances, the beneficiary could incur possibly 2 to 5 days of hospital charges if the decision was not in his/her favor. The organizations recommend that the review be held and decided during the period in which the beneficiary is exempt from charges. That period, as noted above, is 2 days following the hospital's notice of denial of further coverage.

DRG Validation Appeals.—In addition to the appeals process described above, a beneficiary also has another appeal right that lies within the PROs' jurisdiction. It is a limited right of appeal, shared by the practitioner and the provider, re-

garding PRO DRG validation decisions, as follows:

- A beneficiary may obtain a review of a PRO DRG coding change only if that change results in noncoverage of a furnished service.
- A provider or practitioner dissatisfied with a change to the diagnostic or procedural coding information made by a PRO as a result of DRG validation may obtain review if (1) the change caused assignment of a different DRG, and (2) resulted in a lower payment.
- No additional review or appeals is provided for any party.

Waiver of Liability

As already discussed, the Social Security Act, implemented by various regulations and program instructions, distinguishes covered from noncovered services. Normally, a hospital charges the beneficiary for noncovered items and services except under certain limited circumstances. One major circumstance is when payment has been denied because the services have been determined to be medically inappropriate or unnecessary, or to constitute custodial care, and the beneficiary, to whom the services were provided, did not know and could not reasonably have been expected to know that the services were excluded from coverage.

The genesis of this financial relief is Section 1879 of the Social Security Act which provides relief for both the beneficiary *and* the provider if they meet the test that they "did not know or could not reasonably have been expected to know that payment would not be made for such items or services. . . ." The criteria for meeting this test are different for the beneficiary and the provider. Further, the Secretary implemented changes in March 1986 in the test for providers aimed at tightening and narrowing its application. The overall rule is generally referred to as limitation of liability or "waiver of liability" for disallowed claims.

The Beneficiary.—The presumption is made that the beneficiary did not know (and could not have known) that services would not be covered unless the claim file indicates that written notice was given to the beneficiary. The courts have held that under Medicare regulations an individual *is presumed* not to know that further care is being excluded. Therefore, the government has the burden to prove that the beneficiary had actual knowledge by presenting clear and unequivocal evidence of such. *Malvasi* v. *Harris*, U.S. Dis. Ct. of the Northern District of N.Y., No. 79-CV-635, July 30, 1980. However, it is HCFA's position that a determination of noncoverage for a particular beneficiary with regard to a certain service could preclude future payments under waiver of liability for a similar service for the same beneficiary since the beneficiary was on notice of noncoverage.

Responsibility for determining waiver of liability for both the beneficiary and the provider with respect to inpatient hospital care has been delegated to the PROs. They are also responsible for waiver statistics (i.e., denial rates and rate of incorrect hospital issued notices of noncoverage) for purposes of determining whether to revoke a provider's favorable presumption (see *infra*); rebuttal of waiver on a case-by-case basis; and issuance of notices on waiver status.

A beneficiary may appeal the initial decision of a PRO on the waiver issue. The review and appeals process, however, is a hybrid between the two appeals processes already discussed—that of fiscal intermediary determinations and PRO determinations. The PRO makes the initial and reconsideration determination instead of the fiscal intermediary and HCFA. However, the amounts in controversy are the same as those for intermediary/HCFA determinations and not those of PRO determinations; i.e., the beneficiary can appeal a PRO reconsideration to an administrative law judge if the amount in controversy is $100 or more (not $200 or more).

The beneficiary can further appeal the decision of the administrative law judge (or that of the Appeals Council if it has accepted review) to the federal courts, if the amount in controversy is $1000 or more (not $2000 or more). Even if the beneficiary has been held not liable for payment for denied coverage, the beneficiary is allowed to obtain a reconsideration or hearing of the coverage issue in dispute. Part of the reason for allowing reconsideration and appeal under such circum-

stances is that no supplemental insurance policy will pay the portion not covered by Medicare, if the PRO has issued a denial involving medical necessity.

The Provider.—HFCA has promulgated a new regulation, effective March 24, 1986, regarding the application of waiver of liability to providers, practitioners and suppliers of Medicare services under both Part A and B. Formerly, HFCA applied an administrative mechanism commonly known as the favorable presumption in determining whether a hospital, skilled nursing faculty, or home health agency should be held liable for furnishing a noncovered service. The new regulation discontinues use of the favorable presumption and replaces it with a case by case determination of liability.

Entitlement Determinations

- Questions and complaints involving an individual's entitlement to benefits, i.e., insured status or enrollment under Part A are referred to the Social Security Office for determination.
- A beneficiary may request reconsideration of an initial determination by filing for review within 60 days from the date of receipt of notice of the initial determination.
- The beneficiary has a right to a hearing before an administrative law judge, possible Appeals Council review, and ultimately appeal to a court for judicial review.
- There is no required threshold amount in controversy. An appeal can be taken all the way through court review regardless of the amount in controversy.

Medicare Part B

Eligibility

The Part B supplementary medical insurance program is a voluntary program for eligible individuals. An individual is eligible for enrollment if he:

- is entitled to Part A benefits; or
- has attained age 65 and is a resident of the United States and is either a citizen, or an alien lawfully admitted for permanent residence who has resided in the United States continually during the 5 years immediately preceding the month in which he applies for enrollment.

Coverage

The Part B program provides benefits for enrollees that supplement and extend the benefits provided by Part A program. Specifically covered under the Part B program are:

- medical and other health services: these services, numbering 17, explicitly defined in the law, and include physicians services, outpatient hospital services, physical therapy services, ambulance service, prosthetic devices, etc.;
- comprehensive outpatient rehabilitation faculty services; and
- outpatient and ambulatory surgical services.

The Part B program is financed in part by premium payments of individuals enrolled in the program, or premium payments of the states on behalf of the public assistance recipients who are enrolled under federal-state agreement, supplemented by contributions from funds appropriated by the federal government. The monthly premium set for January 1986 through December 1986 is $15.50.

Exclusions From Coverage

Please refer to the discussion in this section of exclusions from coverage under Part A which pertains to both Parts A and B.

Determination, Reconsideration and Appeals Process of Part B Benefit Claims

Determination Regarding Benefit Amounts

Initial Determinations.—A claim for Part B benefit is normally submitted to a carrier. However, under the following circumstances Part B claims are submitted to intermediaries:

- When Part B "medical and other health services" are furnished by a participating provider, outpatient hospital services are furnished by a participating hospital

- Nonemergency Part B services are furnished by a nonparticipating hospital to inpatients or outpatients
- Part B ancillary services are furnished to inpatients of hospitals and skilled nursing facilities for whom Part A benefits are not payable.

An initial determination includes decisions as to whether items and services furnished are covered:

- Whether the deductible has been met;
- Whether the receipted bill or other evidence of payment is acceptable;
- Whether the charges for items or services furnished are reasonable; application of the coinsurance feature; the medical necessity of services and supplies;
- The amount of benefit payable and to whom it should be paid; and if the items or services furnished an enrollee by a physician or a supplier pursuant to an assignment are not covered because they are not reasonable and necessary, whether the enrollee, physician, or supplier knew or could reasonably have been expected to know that the items or services were excluded from coverage.

Review Determination.—Any enrollee under Part B in his own right or through his authorized representative has the right to request a review determination by the carrier or intermediary. The request can be filed with the carrier, an SSA office or with HCFA. An enrollee has a period of 6 months after the date of notice of the initial determination within which to request a review. The review is made on the basis of written evidence without personal appearance of the claimant.

Hearing.—An enrollee can request a "fair hearing" if he is not satisfied with the review determination, and the amount in controversy is $100 or more. The statute itself uses the term "fair hearing" and imposes the requirement of the amount in controversy of $100 or more.

- The enrollee must request the hearing within 6 months after the date of the notice of the review determination. The request must be filed with the carrier or intermediary or at an SSA office of HCFA.
- A fair hearing provides an opportunity for the claimant to appear in person and, if he desires, to be represented by legal counsel or by any other qualified individual. However, the claimant may waive his rights to appear personally.
- The hearing is before a hearing officer designated by the appropriate official of the carrier.

No Judicial Review.—There is *no further* review available. The Social Security Act itself does not provide for any appeal to the Administration from the carrier's, intermediary's, or hearing officer's decision on a Part B claim or for judicial review of the fair hearing decision.

Due Process Problems Under Part B of Medicare.—The constitutional adequacy of the beneficiary appeals process under Part B has been challenged with respect to two major issues. The first was the constitutionality of the Part B fair hearing procedures provided by the Secretary; the second was a challenge to the lack of any oral hearing in cases where the amount in controversy is less than $100.

Fair Hearings—Amount in Controversy $100 or More.—Officers who preside over Part B fair hearings are appointed by and serve at the will of the carrier and may even be past or current employees of the carrier. The United States District Court, Northern District of California, held that the hearing procedure violated due process. The court found that the impartiality of the carrier's hearing officers was compromised by prior involvement and pecuniary interest, and that additional safeguards and procedural protection was needed.

Reversing, the Supreme Court held that there is a presumption that hearing officers are unbiased, and that the plaintiffs failed to rebut this presumption by showing a conflict of interest. The Court considered it significant that the carriers pay Part B claims from federal, not their own, funds, the hearing officers salaries are paid by the Federal Government, and the carriers operate under contracts requiring compliance with standards prescribed by the statute and the Secretary. The Court further held that no additional procedures

were necessary. *Schweiker v. McClure*, 456 U.S. 188(1982).

Hearing Procedure When Amount In Controversy is Less Than $100.—The United States Court of Appeals for the District of Columbia Circuit held that even though Congress in the statute had made no provision for a hearing in cases where the amount in question was less than $100, it had not intended to eliminate the opportunity for *any* type of oral hearing but only wanted to prevent the expense of a formal full "fair hearing" when such small amounts were in controversy.

The court declared that while an oral hearing would not be required in every case, it should be required where there was a question as to a claimant's credibility or veracity. Where credibility and veracity were not at issue, due process requirements were satisfied by a full written review combined with a HCFA offered toll-free telephone system. Further, the court in an earlier judicial proceeding had held that the notices of initial decisions were inadequate because the carriers did not provide an understandable explanation of why benefits were being denied. It remanded revised forms to the United States District Court for further review. *Gray Panthers* v. *Schweiker*, 716 F.2d 23(D.C. Cir. 1983); See also 652 f.2d 146(D.C. Cir. 1981).

Whereas the District of Columbia Court of Appeals had found the carrier's initial determination notices inadequate, the federal District Court in the Eastern District of New York found that the review determination letters were unclear and did not contain adequate information regarding the reasons for reimbursement denial. *David* v. *Heckler*, 591 F.Supp. 1033(E.D. N.Y. 1984). The court was scathing in its criticism; it stated:

> The fact is that the letters are written at a level well beyond most in this segment of the population, with no discernable added benefit from complexity in information provided.
>
> The language used is bureaucratic gobbledegook, jargon, double talk, a form of officialese, federalese and insuranceese, and doublespeak. It does not qualify as English.

HHS has simplified the notices and has issued them on a nationwide basis.

A comprehensive review of all these issues and also underpayment problems arising from inaccurate carrier claims processing is found in the GAO letter of June 1985 to Senator John Heinz in response to his request for information. It is available in the Commerce Clearing House Inc., Medicare and Medicaid Guide at 34,836.

Waiver of Liability Determinations

The concept of waiver of liability applies also to Part B, as provided by Congress in the statute. The administrative process in brief is as follows:

- The decision as to whether the beneficiary and the physician or supplier are entitled to waiver of liability is not made at the time of initial claims adjudication but only at the time of review.
- The parties to a review may seek review on both coverage and waiver of liability issues.
- In the review and hearing process, however, whether or not any party has raised a waiver issue, a waiver of liability determination will be made when items or services have been denied as not *reasonable and necessary*.
- The same review procedures apply with regard to waiver issues as prescribed in coverage issues discussed above. Thus, a "fair hearing" will not be granted unless the amount in controversy is $100 or more, and there is no judicial review.

Entitlement Determinations

- As with Part A claims, the carrier or intermediary refers any disputes as to basic entitlement, i.e., insured status or enrollment to the Social Security Administration for determination.
- A beneficiary may request reconsideration of an initial determination by filing for review within 60 days from the date of receipt of notice of the initial determination.
- The beneficiary has a right to a hearing before an administrative law judge, possible Appeals Council review, and ultimately appeal to a court for judicial review.
- There is no required threshold amount in controversy. An appeal can be taken all the way

through to court review regardless of the amount in controversy.

Citations and References

- All references such as "Section 1811" are to sections of the Social Security Act. The copy of the Act used in this memorandum is that published in the legal service called the Commerce Clearing House, Inc. Medicare and Medicaid Guide which is continually updated.
- All references such as "42 CFR 405" are to sections of the federal regulations governing Medicare. Again, the secondary source used herein for the regulations is the Commerce Clearing House, Inc. Guide. References such as 50 FR 5787 is to the version of a regulation as originally published in the Federal Register (with preamble) as a proposed rule (NPRM) or Final Rule.
- All references such as CCH Para. 4030 are to sections of the Commerce Clearing House Guide which discuss the point at issue. These sections are cited as paragraphs, para.
- Any other references will be explicitly indicated.

Medicare Part A

I. Eligibility

Section 1811; 42 CFR 408.5

II. Coverage

Section 1861(b), (i)(m), (dd)(1); 42 CFR Parts 409, 418

III. Exclusions From Coverage

Section 1862; 42 CFR 403.310-323; CCH Para. 4025-4190

IV. Determination, Reconsideration and Appeals Process of Part a Benefit Claims

A. Determinations Regarding Benefit Amounts/Coverage

Section 1869; 42 CFR 405. 701-750; CCH Para. 13,470-13,480

B. PRO Determinations

- Medical Necessity and Appropriateness Determinations: Problem of Hospital Denial of Continued Inpatient Services and PRO Monitoring

Sections 1151-1155, 1862(g); 50 FR 15312-15335, 15364-15374; 42 CFR 412.92(c); CCH Para. 12,855-12,890; Medicare Peer Review Organization Manual, Transmittal IM 85-2, p. 63; Testimony of National Health Law Program before the Senate Special Committee on Aging: Hearings on Medicare's prospective payment system

- DRG Validation

Section 1866(a)(1)(F); 50 FR 15372

C. Waiver of Liability Determinations

Section 1879; 51 FR 6222(1986); 50 FR 15315, 15331, 15365, and 15372; 42 CFR 195, 196, 405.332, Medicare Intermediary Manual, Part 3, Section A3432.2, Waiver of Liability for Hospitals Under PPS 3/28/84; CCH Para. 11,260 and 13,480

D. Entitlement Determinations

Section 1811, 1869; 20 CFR 404.901 et seq.; CCH Para. 13,500- 13,525

Medicare Part B

I. Eligibility

Section 1831; 42 CFR 405.525

II. Coverage

Section 1832, 42 CFR 405.231

III. Exclusions From Coverage

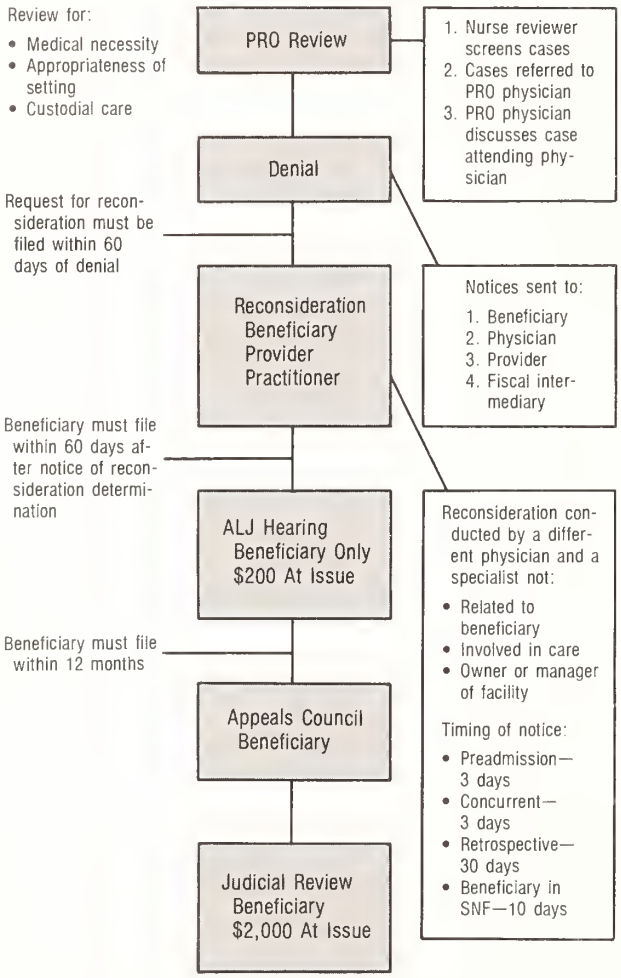
Section 1862; 42 CFR 403.310-323; CCH Para. 4025-4190

IV. Determination, Reconsideration and Appeals Process of Part B Benefit Claims

A. Determination Regarding Benefit Amounts/Coverage

- Due Process Problems

PRO Reconsiderations and Appeals Process



SOURCE: Health Care Financing Administration, 1985.

Section 1869; 42 CFR 801-860; CCH Para. 13,500; GAO letter to Senator J. Heinz, June 28, 1985. Subject: "Medicare Part B beneficiary appeals process." CCH Para. 34,836

B. Waiver of Liability Determinations

Section 1879, 1842(b)(3)(C), CCH Para. 11,260, 13,500; 42 CFR 405.330- 332; Medicare Carriers Manual, HIM-14-3, Section 7300.3.4

C. Entitlements Determination

Sections 1842(b)(3)(C), 1869; 20 CFR 404.901 *et seq.*

ANALYSIS OF THE TRANSITION TO NATIONAL RATES

For the first three years of the prospective payment system (PPS), hospital payments are a blend of regional urban and rural rates, national urban and rural rates, and a hospital-specific rate based on each hospital's historical costs. Over this period, the proportion of payment based on the hospital-specific rates declines, and the blend of regional and national payment rates shifts, until payments are made entirely on the national urban and rural rates.

In July 1985, the Commission recommended a one year pause in the transition to national payment rates. The first part of this section contains the final version of the analysis available to the Commission at the time the recommendation was made. The next part of this section presents an updated version of the analysis, which was included in *Medicare Prospective Payment and the American Health Care System*, a report to the Congress published by the Commission in February 1986. In the final section, the methods and data used in the analysis are described. This discussion also appeared in an Appendix to the February report.

Overall Effects of the Three-Year Transition

The transition to national rates redistributes PPS payments among the Census divisions and among other hospital groupings. Table C-1 shows the change in per-case PPS payments relative to the average for each step of the transition, for various groups of hospitals. Urban hospitals, especially those under 100 beds and hospitals in New England would gain relative to the average. Alternatively, rural hospitals, hospitals in the East North Central and several western Census divi-

Table C-1.—Average Percent Difference In Per-Case PPS Payments Relative To All Hospitals At Each Stage Of The Transition To National Rates, By Type Of Hospital[a]

	75% HSP 25% FED vs 100% HSP	50% HSP 50% FED vs 75%/25%	75% FED 25% HSP vs 50%/50%	100% FED vs 75%/25%	100% FED vs 100% HSP
All Hospitals	0.0	0.0	0.0	0.0	0.0
Urban	0.2	0.1	0.1	0.1	0.5
Rural	−0.7	−0.6	−0.6	−0.6	−2.5
Major Teaching	2.7	2.5	2.3	2.1	10.2
Other Teaching	0.0	0.0	−0.1	−0.2	−0.3
Nonteaching	−0.5	−0.4	−0.4	−0.2	−1.5
New England	2.3	1.8	1.4	0.4	6.2
Middle Atlantic	0.5	0.7	1.0	1.7	4.0
South Atlantic	0.3	0.2	0.2	0.1	0.9
East North Central	0.8	0	−0.7	−2.7	−2.6
East South Central	−0.6	−0.1	0.5	2.3	2.2
West North Central	−1.1	−0.7	−0.4	0.7	−1.5
West South Central	−1.2	−0.8	−0.5	0.4	−2.1
Mountain	−1.2	−0.4	0.1	1.5	0.1
Pacific	−0.1	0.1	0.2	0.6	0.8
Urban <100 Beds	2.5	2.4	2.4	2.6	10.6
Urban 100-404 Beds	0.0	0.0	0.0	0.1	0.1
Urban 405-684 Beds	0.5	0.5	0.4	0.3	1.7
Urban 685+ Beds	−0.2	−0.3	−0.4	−0.6	−1.5
Rural <100 Beds	−0.4	−0.1	0.0	0.1	−0.4
Rural 100-169 Beds	−1.6	−1.6	−1.7	−1.9	−6.9
Rural 170+ Beds	0.0	0.0	−0.1	−0.2	−0.3

[a]Columns differ only by changes in the blend of hospital-specific (HSP) and federal rates (FED). Payments for each step of the transition were modeled using FY 86 policies as described by HCFA in the Final Rule published September 3, 1985. Proposed legislative changes, such as a reduced teaching adjustment and addition of a disproportionate share adjustment are not included. Hospital-specific rates were inflated as if each hospital's accounting year began on October 1st, along with the federal fiscal year. In this way, hospital-specific and federal rates are in constant dollars.

SOURCE: ProPAC analysis based on the Fiscal Year 1984 PATBILL and Provider Specific Files provided by the Health Care Financing Administration.

sions would lose relative to the average. Because current hospital cost data are not available, it is impossible to determine how these shifts in payments affect the financial conditions of hospitals.

In addition to the distributional effects, the transition also has the unintended effect of increasing PPS payments per-case. Table C-2 shows the actual changes in per-case PPS payment for each year of the transition. (The findings presented in this table are the underlying basis for the relative distributional effects shown in Table C-1).

On average, payments per case under fully national rates are 4.3 percent higher than payments based fully on hospital-specific rates. Therefore, as each yearly step of the transition increases the share of payments based on federal rates by 25 percent, average per-case payments increase by about 1 percent.

The increase in per-case payments is probably due to differences between the data used to compute the federal amounts and the data used to calculate the hospital-specific amounts. When the PPS rates were originally established, the most recent set of hospital cost data available were from unaudited Medicare Cost Reports for hospital accounting years ending in 1981. These data were used to compute the regional and national payment rates. The hospital-specific rates that hospitals are actually receiving, however, differ because they are calculated using more recent data—Medicare Cost Reports for hospital accounting years ending during fiscal year 1983—and because the cost reports were audited. After reviewing a sample of hospital cost reports, the General Accounting Office concluded that the current federal rates are 3 percent higher than they would be if audited 1981 data were used.[5]

[5]"Use of Unaudited Hospital Cost Data Resulted in Overstatement of Medicare's Prospective Payment System Rates," General Accounting Office (GAO-HRD-85-74), July 18, 1985.

Table C-2.—Average Percent Difference In Per-Case PPS Payments At Each Stage Of The Transition To National Rates, By Type Of Hospital[a]

	75% HSP 25% FED vs 100% HSP	50% HSP 50% FED vs 75%/25%	75% FED 25% HSP vs 50%/50%	100% FED vs 75%/25%	100% FED vs 100% HSP
All Hospitals	1.0	1.0	1.1	1.1	4.3
Urban	1.2	1.2	1.2	1.2	4.8
Rural	0.3	0.5	0.5	0.5	1.7
Major Teaching	3.7	3.5	3.4	3.2	14.5
Other Teaching	1.1	1.0	1.0	0.9	4.0
Nonteaching	0.5	0.6	0.7	0.9	2.8
New England	3.3	2.9	2.5	1.5	10.5
Middle Atlantic	1.5	1.7	2.0	2.8	8.3
South Atlantic	1.3	1.3	1.3	1.2	5.2
East North Central	1.8	1.1	0.4	−1.6	1.6
East South Central	0.4	1.0	1.6	3.4	6.4
West North Central	−0.1	0.3	0.7	1.8	2.8
West South Central	−0.2	0.2	0.5	1.5	2.1
Mountain	−0.2	0.7	1.2	2.6	4.4
Pacific	0.9	1.1	1.3	1.7	5.1
Urban <100 Beds	3.5	3.5	3.5	3.7	14.9
Urban 100-404 Beds	1.0	1.0	1.1	1.2	4.4
Urban 405-684 Beds	1.5	1.5	1.5	1.4	6.0
Urban 685+ Beds	0.8	0.8	0.7	0.5	2.8
Rural <100 Beds	0.6	1.0	1.0	1.3	3.9
Rural 100-169 Beds	−0.6	−0.6	−0.6	−0.8	−2.6
Rural 170+ Beds	1.0	1.0	1.0	0.9	4.0

[a]Columns differ only by changes in the blend of hospital-specific (HSP) and federal rates (FED). Payments for each step of the transition were modeled using FY 86 policies as described by HCFA in the Final Rule published September 3, 1985. Proposed legislative changes, such as a reduced teaching adjustment and addition of a disproportionate share adjustment are not included. Hospital-specific rates were inflated as if each hospital's accounting year began on October 1st, along with the federal fiscal year. In this way, hospital-specific and federal rates are in constant dollars.

SOURCE: ProPAC analysis based on the Fiscal Year 1984 PATBILL and Provider Specific Files provided by the Health Care Financing Administration.

Although the budget neutrality adjustments were calculated so that per-case payments under each of the three rates would be equal, hospital-specific rates for the budget neutrality calculation were estimated using the 1981 data, since the actual amounts were not yet available. Computer files containing the hospital-specific amounts and teaching adjustments hospitals are actually receiving were not available to the HCFA Central Office until this summer.

The 4.3 percent difference between federal and hospital-specific payments per-case may not directly translate into outlays that are 4.3 percent higher in fiscal year 1987 for several reasons. First, the 4 percent estimate does not take into account differences between hospital accounting years and the federal fiscal year. Second, it is a per-case estimate based on hospitals' fiscal year 1984 case mix. Assumptions regarding changes in volume and case mix would have to be factored into an outlay estimate. Finally, federal payments were modeled as if fiscal year 1986 policies included in the recently published rules were in effect for each phase of the transition. These policies include a zero update factor and changes in the outlier cutoffs and area wage index. An estimate of the actual differential between fully national rates and hospital-specific rates when the transition is completed depends in part upon future policies. Similarly, an estimate of the actual differential occuring during the first two years of PPS should take into account the rules in effect during those years.

The federal fiscal year analysis described below addresses some of these issues by factoring in policy changes occuring between fiscal year 1985 and fiscal year 1986 and differences between hospital accounting years and the federal fiscal year. The resulting estimate of the effects of the transition from fiscal year 1985 to fiscal year 1986 is still on a per-case basis, and it is subject to volume and case-mix assumptions.

Effects of the Transition From FY 85 to FY 86

As shown in Table C-3, the distributional effects of continuing the transition in fiscal year 1986 are similar to those shown above for the full transition. If the transition proceeds, hospitals that would do better than average include small urban hospitals and hospitals in New England. Alternatively, per-case payments to rural hospitals and hospitals in the East North Central Census division would decline relative to the average.

The overall increase in per-case payments from fiscal 1985 to fiscal year 1986 due to the transition is 0.34 percent. This is smaller than the 1 percent described above because it reflects differences in hospital accounting years. For those hospitals with accounting years that begin after October 1st, only part of the effect of the transition occurs during the federal fiscal year.

If the formula for computing the indirect teaching adjustment is changed, the effect on average payments per-case and some of the distributional effects of the transition are reduced. The last two columns of Table C-3 show the difference between fiscal year 1985 and fiscal year 1986 payments with and without proceeding with the transition if a teaching adjustment similar to the one being considered by the Congress were used.[6]

With an alternative teaching adjustment, the overall difference between fiscal year 1986 payments if the transition proceeds and if there is a pause in the transition would be 0.12 percent, in contrast to the 0.34 percent if the current teaching adjustment were used. In addition, the relative gains due to the transition received by teaching hospitals would be almost entirely reduced. Major teaching hospitals, which would experience a 1.2 percent increase due to the transition under the current adjustment would experience a 0.14 percent rise in payments, an increase only slightly greater than the overall average. The alternative adjustment would also reduce the difference in the effects of the transition on urban and rural hospitals.

Even with an alternative teaching adjustment, significant regional variation would remain, however. Relative gains would be experienced by hospitals in New England and the East South Central Census divisions and losses by hospitals in the East and West North Central Census divisions.

[6]The adjustment used for Table C-3 would raise PPS payments by 8.7 percent for each 10 percent increase in the intern and resident to bed ratio. No adjustment for hospitals serving a disproportionate share of low-income patients is included.

Table C-3.—Average Percent Difference Between FY 86 PPS Payments If The Transition Continues And With A Pause In The Transition By Type Of Hospital[a]

	Current Teaching Adjustment[b]		Alternative Teaching Adjustment[b]	
All Hospitals	0.34	0.00	0.12	0.00
Urban	0.39	0.05	0.13	0.01
Rural	0.09	−0.25	0.06	−0.05
Major Teaching	1.18	0.84	0.14	0.03
Other Teaching	0.26	−0.07	−0.08	−0.19
Nonteaching	0.24	−0.10	0.24	0.12
New England	2.17	1.84	1.49	1.38
Middle Atlantic	0.35	0.01	0.15	0.03
South Atlantic	0.68	0.34	0.46	0.35
East North Central	−0.46	−0.80	−0.76	−0.88
East South Central	0.97	0.63	0.85	0.73
West North Central	0.17	−0.17	−0.05	−0.17
West South Central	0.29	−0.04	0.16	0.04
Mountain	0.46	0.12	0.32	0.20
Pacific	0.51	0.18	0.35	0.23
Urban <100 Beds	1.85	1.51	1.83	1.71
Urban 100-404 Beds	0.36	0.02	0.23	0.12
Urban 405-684 Beds	0.41	0.07	0.07	−0.05
Urban 685+ Beds	0.16	−0.17	−0.61	−0.73
Rural <100 Beds	0.45	0.11	0.45	0.33
Rural 100-169 Beds	−0.58	−0.92	−0.59	−0.70
Rural 170+ Beds	0.38	0.04	0.29	0.18

[a]In calculating federal fiscal year payments for each hospital, individual hospital accounting years were observed. Payments for fiscal year 1986 are based on HCFA's September 3, 1985 Final Rule. The alternative teaching adjustment used would raise PPS payments by 8.7 percent for each 10 percent increase in the intern and resident to bed ratio. No adjustment for hospitals serving a disproportionate share of low-income patients is included.
[b]Transition continuation shown in first column, transition pause in second.

SOURCE: ProPAC analysis based on the Fiscal Year 1984 PATBILL and Provider Specific Files provided by the Health Care Financing Administration.

A pause in the transition, during which all hospitals receive 50 percent hospital-specific rates and 50 percent federal rates, would reduce the range of gains and losses in per-case PPS payments. If the transition continues, 38 percent of hospitals would experience changes in per-case payments greater than 5 percent from fiscal 1985 to fiscal year 1986, including 10 percent of hospitals with a change of 10 percent or more. A pause in the transition would reduce the proportion of hospitals with per-case payment changes greater than 5 percent from 38 percent to 18 percent. (Table C-4)

Analysis of the Distribution of Medicare Payments to Hospitals Updated for Proposed Legislative Changes

The implementation of national PPS rates has and will continue to affect the distribution of Medicare revenue among hospitals. It is not evident, however, that the projected changes in distribution of payment reflect differences in efficiency. Given the likelihood of constraints in PPS payments under the Gramm-Rudmann-Hollings Act, some hospitals may be vulnerable to serious financial problems, perhaps even closure. While hospitals may implement measures to prevent these problems by increasing efficiency, it is not clear that such strategies will be effective in dealing with the effects of continued redistribution of constrained payments. Accordingly, more study of the reasons for differences in hospital costs is necessary.

During the transition to national rates, PPS payments are a blend of hospital-specific rates, regional average rates, and national average rates. The transition was designed to give hospitals time to adjust to the redistributive effects of payments based solely on national rates. Table C-5 shows differences in payment based on national rates compared to hospital-specific rates across regions, by teaching status, and by hospital bedsize. Since

Table C-4.—Distribution Of Hospitals, By Percent Increases And Decreases In PPS Payments From FY 85 To FY 86, If The Transition Continues And With A Pause In The Transition

	Percent Payment Difference			
	Total	0-5	5-10	10+
All Hospitals (Continue Transition)				
Percent With Increase	67	37	21	8
Percent With Decrease	33	24	7	2
Total	100	61	28	10
All Hospitals (Pause Transition)				
Percent With Increase	63	48	13	3
Percent With Decrease	37	35	2	*
Total	100	83	15	3

*Less than 0.5 percent.

[a]In calculating federal fiscal year payments for each hospital, individual hospital accounting years were observed. Payment for Fiscal Year 1985 are based on HCFA's August 31, 1984 Final Rule. Payments for Fiscal Year 1986 are based on HCFA's September 3, 1985 Final Rule. Proposed legislative changes, such as a reduced teaching adjustment and addition of a disproportionate share adjustment are not included.

SOURCE: ProPAC analysis based on the Fiscal Year 1984 PATBILL and Provider Specific Files provided by the Health Care Financing Administration.

they are based on each hospital's historical costs, payments under hospital-specific rates reflect the distribution of Medicare payments under cost reimbursement. (See below for a discussion of the data and methodology underlying the estimates.)

Much of the pattern of changes in distribution of payments under PPS is difficult to explain. It is not evident that the hospitals that gain the most from national rates are necessarily the most efficient. Among the hospital groups that do relatively well under national average payment rates are urban hospitals with fewer than 100 beds, and hospitals in the New England and East South Central Census Divisions. Groups of hospitals that fare worse than average are large rural hospitals and hospitals located in the East and West North Central Census Divisions.

The addition of New York hospitals, which only began PPS in January 1986, could have a large effect on the distribution of payments under national rates. In particular, when modeled using fiscal year 1984 discharges, outlier payments to New York would increase total outlier payments to hospitals by over 30 percent. This result is caused by the much higher than average length of stay in New York hospitals under the pre-PPS waiver payment system, in which payments were made on a per-diem basis. These estimated outlier payments are unlikely to be entirely realized because PPS has incentives to reduce length of stay, and because outlier payments are not allowed for days in which Medicare patients are awaiting nursing home placement.

Table C-5.—Average Relative Difference Between Per-Case Payments Based On Hospital-Specific Rates And On National Rates (In Percent)[a]

Hospital Type	With New York[b]	Without New York
All Hospitals	0	0
Urban	0.6	0.2
Rural	−3.3	−1.0
Major Teaching	4.3	1.1
Other Teaching	−0.5	−1.1
Nonteaching	−0.6	1.2
Disproportionate share hospitals	4.3	1.9
New England	0.6	3.2
Middle Atlantic	15.2	2.1
South Atlantic	−1.5	1.1
East North Central	−6.4	−3.8
East South Central	1.4	3.9
West North Central	−4.6	−2.0
West South Central	−3.6	−1.0
Mountain	−3.1	−0.5
Pacific	−0.5	2.1
Urban >100 Beds	10.2	11.3
Urban 100-404 Beds	1.5	1.4
Urban 405-684 Beds	0.6	0.1
Urban 685+ Beds	−2.5	−6.1
Rural >100 Beds	−0.7	1.6
Rural 100-169 Beds	−7.4	−5.1
Rural 170+ Beds	−2.1	0.5

[a]National payments were estimated using the new weights, outlier thresholds, and area wage index included in the HCFA regulations published in the September 3, 1985 *Federal Register*, modified by the Conference agreement on budget reconciliation (H.R. 3128), which includes a lower teaching adjustment from current law and the addition of an adjustment for disproportionate share hospitals.

[b]Estimated payments to New York, which began PPS in January 1986, may be overstated. This effects the distribution of payments across all hospitals. In particular, estimated outlier payments to hospitals in New York are unlikely to be entirely realized because PPS has incentives to reduce length of stay.

SOURCE: ProPAC analysis based on the Fiscal Year 1984 PATBILL and Provider Specific Files provided by the U.S. Department of Health and Human Services, Health Care Financing Administration.

Although payments to hospitals outside New York do not change, New York is a large enough state to affect the overall average, and therefore affect how hospitals in other regions do relative to the average. For example, the increase in per-case payments to hospitals in the South Atlantic region under national rates is 1.1 percentage points above the average without New York but 1.5 percentage points below the average with New York. Moreover, because New York has many major teaching hospitals, the relative increase in

payments under national rates is larger for this group when New York hospitals are included.

To the extent that length of stay is not shortened in New York hospitals, future outlier payments may be reduced for all hospitals. The PPS statute requires that outlier thresholds be set so that payments are between 5 and 6 percent of all PPS payments. If outlier payments to New York are large enough, future outlier thresholds may be tightened for all hospitals so that outlier payments fall in the required range.

The hospitals that are estimated to have the largest declines in payment from hospital-specific to national rates also show different trends in occupancy rates and staffing patterns. Between 1980 and 1984, the occupancy rate for this group of hospitals fell from 68 percent to 57 percent compared to a drop from 66 percent to 59 percent over all PPS hospitals. In addition, the average increases in staffed beds and full-time equivalent personnel were much slower for these hospitals than for the average PPS hospital. The average hospital in this group experienced a 2 percent increase in FTEs between 1980 and 1984, compared to 5 percent for all hospitals.

The distribution of PPS payments under national rates can be further understood by looking at the payment components separately. These components are the basic wage-adjusted national rate, payments for the indirect costs of teaching interns and residents, outlier payments, and payments to hospitals serving a disproportionate share of low-income patients. Table C-6 shows the proportion of PPS payments attributed to each of these components under fully national PPS rates.

If proposed changes in payment for teaching and disproportionate share hospitals occur, indirect teaching payments would comprise 4 percent of the total and outlier payments (under the new cutoffs) 6 percent. These proportions would vary by region and type of hospital, however. For example, part of the shift in payment from rural to urban hospitals results from outlier payments. Although the percent reduction in the standardized amounts for outlier payments is the same for urban and rural rates, outlier payments comprise 6 percent of total payments to urban hospitals and only 3 percent of payments to rural hospitals.

Description of the Payment Model

For some of the analyses described above, hospital payments were estimated using a microsimulation model that computes PPS payments to individual hospitals for each year of the transition to national rates. This section describes the data sources used in the model, the hospitals included and excluded from the analysis, how the model works, and the limitations of the model.

Data Sources

The hospital payment model uses data from a number of sources:

- The HCFA Provider File with information on 5833 hospitals supplied by the intermediaries, was the source of the uninflated hospital-specific amount, hospital accounting year, teaching ratio, MSA designation (used to assign the appropriate wage index), and special hospital designation (sole community hospitals, rural referral centers, redesignated rural hospitals). The data included in the file are those in effect at the end of December 1984, and were verified by the HCFA Central Office.
- The fiscal year 1984 PATBILL file of 10.6 million Medicare inpatient hospital stays was used to compute individual hospital case-mix indexes and outlier payments, and to count each hospital's discharges. Stays included in the file were those for discharges occurring during fiscal year 1984 for which a bill was received by the end of April 1985. About 54 percent of the bills were submitted by hospitals under PPS, with the remainder submitted while the hospital was still under TEFRA rules. The file includes DRG assignment made using the Grouper rules proposed by regulation for fiscal year 1986.
- A HCFA wage index file containing the index proposed by regulation for fiscal year 1986 was used.

Hospitals Included in the Model

Of the 5833 hospitals for which provider-specific data were submitted by the intermediaries, 5630 were included in the model. Hospitals were excluded for the following reasons:

Table C-6.—Distribution Of PPS Payments By Type Of Payment (In Percent)[a]

Hospital Type	Basic Payment	Outlier Payment[b]	Indirect Teaching Payment[c]	Disproportionate Share Payment[d]
All Hospitals	89%	6%	4%	2%
Urban	87	6	5	2
Rural	96	3	1	*
Major Teaching	66	10	20	4
Other Teaching	86	6	6	2
Nonteaching	94	4	0	1
Disproportionate share hospitals	81	7	7	5
New England	82	11	6	1
Middle Atlantic[e]	84	8	6	1
South Atlantic	90	5	3	2
East North Central	88	6	5	1
East South Central	91	4	4	1
West North Central	91	5	2	2
West South Central	92	4	2	2
Mountain	93	4	3	*
Pacific	88	5	4	3
Urban <100 Beds	96	3	*	*
Urban 100-404 Beds	90	6	2	2
Urban 405-684 Beds	84	7	7	2
Urban 685+ Beds	78	8	12	2
Rural <100 Beds	97	2	*	*
Rural 100-169 Beds	97	3	*	*
Rural 170+ Beds	95	4	1	*

* = less than 0.5 percent.
Rows may not total to 100 due to rounding.
[a]National payments were estimated using the new weights, outlier thresholds, and area wage index included in the HCFA regulations published in the September 3, 1985 *Federal Register*, modified by the Conference agreement on budget reconciliation (H.R. 3128), which includes a lower teaching adjustment from current law and the addition of an adjustment for disproportionate share hospitals.
[b]Includes indirect teaching and disproportionate share payments earned on outlier cases.
[c]Excludes indirect teaching payments earned on outlier cases.
[d]Excludes disproportionate share payments earned on outlier cases.
[e]New York hospitals were excluded from estimates presented in this table. See Note [b] Table C-5.

If proposed changes in payment for teaching and disproportionate share hospitals occur, indirect teaching payments would comprise 4 percent of the total and outlier payments (under the new cutoffs) 6 percent. These proportions would vary by region and type of hospital, however. For example, part of the shift in payment from rural to urban hospitals results from outlier payments. Although the percent reduction in the standardized amounts for outlier payments is the same for urban and rural rates, outlier payments comprise 6 percent of total payments to urban hospitals and only 3 percent of payments to rural hospitals.

- Some hospitals included on the Provider file had no matching discharges on the PATBILL file. It is likely that many of these hospitals are exempt from PPS since discharges from these hospitals were removed from the PATBILL file.
- Twelve alcohol hospitals were included in the Provider file, but were removed from the analysis because they are exempt from PPS.
- Forty-one new providers were excluded from the analysis because they do not have a hospital-specific rate.
- For the analyses reported, hospitals from the two waiver states (Maryland and New Jersey) were excluded since they are not currently on PPS. They could be included in future analyses.

How the Model Works

The payment amounts model uses the above data, along with the standardized amounts and payment rules as published in the September 3, 1985 *Federal Register*, to compute each hospital's PPS payments under fully hospital-specific rates and fully national rates. These regulations include new DRG weights, outlier thresholds, and area wage index values. Special rules affecting payments to sole community hospitals, rural referral centers, and redesignated rural hospitals are

built into the model as they would be applied to each year's payments.

Hospital payments are modeled as if all hospitals had accounting years that begin on October 1st, along with the Federal fiscal year. Although this would be an inappropriate method to use in estimating total Medicare payments, it is useful for looking at the full distributional effects of PPS payments.

In addition, proposed legislative changes in the adjustment for indirect teaching and the addition of a disproportionate share adjustment were included. Although implementation of the regulations has been delayed and the legislative changes have not yet been passed, they are likely to be finalized in the near future. Legislative changes were modeled as described in the Conference agreement to H.R. 3128, the Consolidated Omnibus Budget Reconciliation Act of 1985.

The Conference agreement would modify the indirect teaching adjustment to reduce the additional payment to teaching hospitals, and to make the formula "curvilinear." Instead of a linear add-on of 11.59 percent for every 10 percent increase in the ratio of residents to beds, the new adjustment would be reduced to 8.1 percent, with decreasing incremental payments as the ratio of residents to beds rises.

The Conference agreement defines disproportionate share hospitals and provides for additional payment to these hospitals. Urban hospitals with 100 beds or more are considered to be disproportionate share hospitals if low-income patients make up 15 percent or more of the hospital's patient load. Low-income patients are defined as the sum of the percent of the hospital's total inpatient days attributed to Medicaid patients and the percent of the hospital's Medicare inpatient days attributed to beneficiaries who are also eligible for Supplemental Security Income.

Outlier payments are estimated by applying the thresholds proposed for fiscal year 1986 to all the cases in the PATBILL file. Adjustments for indirect teaching and disproportionate share hospitals are also included in the outlier payments.

An adjustment to payments was made to estimate the Conference agreement requirement that the standardized amounts be re-standardized using the new indirect teaching adjustment. Urban and rural payments were adjusted by separate factors so that total payments for each group would equal payments if the teaching adjustment were reduced to 8.7 percent and there were no additional payment for disproportionate share hospitals. This adjustment has the effect of reducing payment to urban hospitals relative to rural hospitals, since indirect teaching payments comprise a larger portion of payment to urban hospitals than to rural hospitals.

Limitations of the Estimates

The model incorporates important simplifying assumptions that limit its accuracy in predicting total PPS payments and might affect the distributional results described here. Volume, length of stay, and case-mix information from fiscal year 1984 were used to estimate payments under fully hospital-specific and fully national rates. These factors are expected to change from year to year, and the pattern of changes might affect the distribution of PPS payments. For example, if case-mix is increasing faster in one group of hospitals than the average, we may be understating the relative payments under national rates of this group. Further decline in lengths of stay would reduce the proportion of payments made for outlier cases.

Moreover, changes in policy from those used to estimate payments could have important effects on the distribution of payments. For example, if a larger reduction was made in the indirect teaching adjustment, payments to teaching hospitals would be reduced. The size of the update factor would not affect the results, however, since this would be applied equally across all hospitals, and the results describe relative payments to different types of hospitals.

A further limitation of the model is that it probably underestimates payments for cost outlier cases, but this should not affect the results significantly. A case is a cost outlier if it is not a day outlier, and its covered costs—defined as 72 percent of covered charges—exceed a threshold that is the higher of a dollar amount $13,500 or two times the Federal payment for that DRG. Payment

for these cases is equal to 60 percent of the difference in the threshold and the covered costs.

In the model, covered charges in fiscal year 1984 dollars are being compared to the fiscal year 1986 threshold. Since charges are most likely higher than they were in fiscal year 1984, the model probably identifies too few cost outlier cases, and for the cases that do exceed the threshold, cost outlier payments that are too low. Since payment for cost outlier cases comprise only about 1 percent of all PPS payments, the effects of this underestimate on the model's results are probably not significant.

Appendix D

Prospective Payment Reports, Studies, and Research

Appendix D

Prospective Payment Reports, Studies, and Research

INTRODUCTION

In Pub. L. 98-21, Congress directed the Prospective Payment Assessment Commission to collect and assess information that would enable the Commission to fulfill its mandate to recommend DRG adjustments and an update factor reflecting appropriate patterns of resource use in the delivery of safe, efficacious, and cost-effective care. To facilitate the collection and assessment of information, Congress gave the Commission broad authority to award grants and contracts for needed research. It also directed the Commission to adopt procedures allowing interested parties to submit information, and to utilize existing information where possible.

The following compilation of Federal and non-Federal studies relevant to prospective payment is an ongoing effort, developed so that the Commission and its staff would have knowledge of work completed, in progress, planned, and proposed. Such information is essential to the Commision's own data development and analytic agenda.

This compilation was prepared with the assistance of staff from the noted agencies and organizations, to whom the Commission extends its gratitude. Special appreciation is extended to the Office of Technology Assessment. While the listing attempts to be comprehensive, there no doubt are omissions. The Commission therefore encourages organizations to provide corrections and updated material so that it will be able to consider such information in its future deliberations.

PART I: FEDERALLY-SUPPORTED PPS STUDIES

STUDIES OF MEDICARE'S PPS MANDATED BY CONGRESS

Study Topic	Report due date	Agency	Status (as of February 1986)
Reports Mandated by Social Security Amendments of 1983 (Public Law 98-21):			
1983-1984 reports:			
1. Impact of Single Limits on Skilled Nursing Facilities	12/31/84	HCFA-OLP	Complete (1/85)
2. Impact of Hospital PPS on Skilled Nursing Facilities	12/31/84	HCFA-OLP	Complete (1/85)
3. Including U.S. Territory Hospitals	4/1/84	HCFA-BERC	In clearance[a]
4. Incorporating Capital Into PPS	10/14/84	ASPE	In clearance[a]
5. Annual PPS Impact Reports, 1984-87	12/31/84-87	HCFA-ORD-R	1984, Complete 1985, In process
1985 reports:			
6. Annual Report and Recommendations on PPS to the Secretary of Health and Human Services	April, Annually	ProPAC	1st Annual Complete (4/85)
7. Occupancy of Sole Community Hospitals	4/1/85	HCFA-ORD-R	In clearance[a]
8. A-B Information Transfers	4/1/85	HCFA-ORD-BPO	In clearance[a]
9. Uncompensated Care Costs	4/1/85	HCFA-ORD-R	In clearance[a]
10. Cost of Care Information to Patients	4/1/85	HCFA-ORD-R	Complete (8/85)
11. Large Rural Teaching Hospitals	4/1/85	HCFA-ORD-R	In process
12. Case-Mix Measurement: Refinements of DRGs (including severity of illness, intensity of care, and adequacy of outlier payment)	12/31/85	HCFA-ORD-R	In clearance[a]
13. Eliminating Rural-Urban Rates	12/31/85	HCFA-ORD-R	In process
14. Exempted Hospitals Report: Long-Term Care Hospitals, Psychiatric Units, Rehabilitation Units, and Pediatric Hospitals	12/31/85	HCFA-ORD-R	In clearance[a]
15. All-Payer Feasibility, Cost-Shifting	12/31/85	HCFA-ORD-R	In process
16. Impact of Admission, Volume Adjustment	12/31/85	HCFA-ORD-R	In clearance[a]
17. Physician DRGs -- Including Payments for Physicians' Services to Hospital Inpatients in DRG Payment Amounts	7/1/85	HCFA-ORD-R	In clearance[a]
1986 reports:			
18. Impact of State Alternatives to PPS on Medicare, Medicaid, Private Health Expenditures, and Tax Expenditures	12/31/86	HCFA-ORD-D	--
Reports Mandated by the Deficit Reduction Act (Public Law 98-369):			
1984 reports:			
19. Prospective Payment for Skilled Nursing Facilities	8/1/84	HCFA-OLP	Complete (1/85)
20. Prospective Payment System Wage Index Adjustments	8/18/84	HCFA-BERC	Complete (4/85)
21. Options for Prospective Payment for Skilled Nursing Facilities	12/1/84	HCFA-OLP	Complete[b] (1/85)
22. Definition and Identification of "Disproportionate Share" Hospitals	12/31/84	HCFA-BERC/ORD	Complete (12/85)

Please Note: Footnotes are detailed on the last page of Part I.

Study Topic	Report due date	Agency	Status (as of February 1986)
1985 reports:			
23. Urban/Rural Payment Differential	1/18/85	HCFA-ORD-R	To be included with study #13
24. Advisability and Feasibility of Varying by DRG Proportions of Labor and Nonlabor Components of the Federal Payment Amount	1/18/85	HCFA-ORD-R	To be included with study #13
25. Pacemaker Payment Review (Part A)	3/1/85	ProPAC	Complete (3/85)
26. Pacemaker Payment Review (Part B)	3/1/85	HCFA-BQC	In process
27. Closure and Conversion of Underutilized Hospital Facilities	3/1/85	HCFA-BERC/ORD-D	In clearancea
28. Certified Registered Nurse Anesthetists	7/1/85	HCFA-BERC/ORD-D	Inc process
29. Hospital Specific Variance	9/1/85	HCFA-ORD-R	To be included with study #13
30. Exceptions to Wage Index Adjustments	--	HCFA-BERC	--
Reports Requested by the House Appropriations Committee Report (Report 98-911 on H.R. 6028):			
1985 reports:			
31. Effect of PPS on Clinical Trials	--	NIH/HCFA	Initial NIH-NCHSRT study expected Winter 1986
32. Annual Report on Impact of PPS on Blood Banking	--	HCFA	Expected mid-1986
33. Effects of PPS on American Health Care System	February, annually	ProPAC	1st annual complete (2/86)

ABBREVIATIONS: ASPE: Assistant Secretary for Planning and Evaluation (DHHS)
HCFA: Health Care Financing Administration
--BERC: Bureau of Eligibility, Reimbursement, and Coverage
--BPO: Bureau of Program Operations
--BQC: Bureau of Quality Control
--OLP: Office of Legislative Policy
--ORD-R: Office of Research and Demonstrations, Office of Research
--ORD-D: Office of Research and Demonstrations, Office of Demonstrations and Evaluations
ProPAC: Prospective Payment Assessment Commission

SOURCE: Personal communication by ProPAC staff with Office of Research and Demonstrations, Health Care Financing Administration, Department of Health and Human Services, Baltimore, Maryland, February 1986.

ORD-SUPPORTED, NONMANDATED STUDIES OF PROSPECTIVE PAYMENT FOR HOSPITALS ACTIVE IN 1985

Study Topic	Period	Funding	Status (as of February 1986)
State Alternatives to PPS:			
1. National Hospital Ratesetting Study	8/78 to 2/85	$ 5,544,478	3 of 8 volumes published
2. Incentive Prospective Payment System for Hospitals Through Fiscal Intermediaries	9/82 to 9/86	Waiver (MA)	--
3. Rochester Area Hospitals' Corp.	1/80 to 12/86	Waiver (NY)	--
4. Finger Lakes Area Hospitals' Corp.	1/81 to 12/85	Waiver (NY)	May be extended
5. Prospective Reimbursement Systems Based on Patient Case Mix for New Jersey Hospitals	12/76 to 12/84	$ 4,912,802	Complete
6. Proposal of the Development of a Hospital Reimbursement Methodology for New York State for the 1980s	1/83 to 12/85	Waiver (NJ)	Complete
7. Prospective Payment System for Acute and Chronic Care Hospitals in Maryland	6/80 to 8/84	$ 2,037,563	Complete
8. Response of Massachusetts Acute Care Hospitals to the Massachusetts Hospital Cost Containment Act	12/84 to 11/85	$ 167,758	Complete
Evaluation Studies: (The following are background studies to support the Congressionally mandated Annual PPS Impact Reports)			
9. Prospective Payment Beneficiary Impact Study	3/84 - ongoing	Intramural	In clearancea
10. Commission on Professional and Hospital Activities Study (on quality-related process and hospital utilization before and during PPS)	9/84 to 9/88	$ 212,057	--
11. Rand Investigation Into Quality Indicators	9/84 to 12/87	$ 860,679	--
12. Selected Analyses of PPS Impact on Hospital Behavior	7/84 to 7/87	$ 480,423	--
13. Longitudinal Studies of Local Area Hospital Use	7/84 to 7/87	$ 214,290	--
14. Appropriateness of Hospitalization: A Comparative Analysis of Reliability and Validity of the Appropriateness Evaluation Protocol and Standardize Medreview Instrument	7/84 to 1/86	$ 306,342	--
15. Trends in Distribution of Medicare Expenditures	Fall 1985	Intramural	In process
16. Relation of Surgical Volume to Mortality After Surgery	Winter 1985	Intramural	Preliminary draft, complete
17. Rehospitalization After Surgery Among Medicare Enrollees	Winter 1985	Intramural	In process
18. Study of the Relationship Between Cause of Death and Medicare Costs	Spring 1986	Intramural	--
19. Impact of DRG-Based PPS on Quality of Care for Hospitalized Medicare Patients	9/85 to 9/88	$3,046,798	--
20. Non-Intrusive Outcome Measures, Identification and Validation	9/84 to 9/87	$ 860,679	--
21. Medicare-Medicaid Payment Policies and Capital Formation	4/83 to 12/85	$ 282,671	Complete
22. Prospective Payment System and Post-Hospital Care: Use, Cost, and Market Changes	9/85 to 3/88	$ 706,118	--
23. Impact of Medicare's Prospective Payment System and Private Sector Initiatives: The Blue Cross and Blue Shield Organizations Experiences	9/85 to 8/87	$ 270,000	--

ORD-Supported, Nonmandated Studies of Prospective Payment for Hospitals Active in 1985, continued

Study Topic	Period	Funding[c]	Status (as of February 1986)
Case-Mix Measurement: (The following are background studies to support Congressionally-mandated studies on case-mix and exempt hospitals)			
21. Measuring the Cost of Case Mix Using Patient Management Algorithms	9/78 to 7/84	$ 1,166,846	Complete
22. Severity of Illness Within DRGs	8/83 to 8/84	$ 87,711	Complete
23. DRGs and Nursing Resources	7/84 to 7/86	$ 427,910	--
24. DRG Refinements for Nursing Care	8/83 to 3/85	$ 369,650	Complete
25. Severity of Illness and DRGs in Selected Cancers	9/84 to 9/87	$ 214,010	--
26. Learning From and Improving DRGs for End-Stage Renal Disease Patients	7/84 to 7/86	$ 187,500	--
27. Children's Hospital Case-Mix Classification System	7/84 to 12/85	$ 395,000	In process
28. Study to Develop and Test Measures of Case Mix, Complexity, Case Mix Severity, and Case Volume for Hospitals	9/78 to 5/84	$ 426,630	Complete
29. Study to Determine Reasons for 7.4% Rise in Overall Case-Mix Index of Hospitals in 1984	1/85 to 3/85	Intramural	Complete
30. Case-Mix and Resource Use in Hospital Emergency Room Settings	3/83 to 9/85	$ 612,785	In process
31. Disproportionate Share Hospitals: Costs to Case Mix	Fall 1986	Intramural	--
32. Disease-Specific Severity Adjustments to Diagnosis-Related Groups	1/86 to 12/87	$ 280,129	--
33. Diagnostic Mix, Illness Severity, and Costs in Teaching and Nonteaching Hospitals	9/85 to 9/87	$ 383,951	--
34. Diagnosis-Related Groups Refinement Using Measures of Disease Severity	9/85 to 8/86	$ 325,000	--
35. Methods to Improve Case Mix and Severity of Illness Classification for Use in the Medicare Prospective Payment System	9/85 to 8/88	$ 926,613	--
Other:			
36. Prospective Payment In Rehabilitation Hospitals and Programs	10/84 to 9/85	$ 724,000	In process
37. Evaluation of National Rural Swing-Bed Program	9/83 to 6/86	$ 722,248	--
38. PRO Quality Objective Report	4/85 - ongoing	Intramural	--

SOURCE: U.S. Department of Health and Human Services, Health Care Financing Administration, Status Report, (Washington, D.C.: U.S. Government Printing Office, January 1986); updated by ProPAC staff through personal communication with ORD, February 1986.

The HCFA Health Policy Centers are the Rand/University of California, Los Angeles, Health Financing Policy Research Center and the Brandeis University Health Policy Research Consortium. The Centers provide support research to HCFA for use in the preparation of the Reports to Congress mandated in the legislation enacting the Medicare prospective payment system (Pub. L. 98-21).

The Rand/University of California, Los Angeles
Health Financing Policy Research Center

Research Topics:

1. The impact of PPS on classes of hospitals, beneficiaries, other payers, and other providers.
2. The method under which rehabilitation hospitals and units can be paid on a prospective basis.
3. The advisability of the provision of cost-of-care information to public and private payers.
4. Methods for evaluating the impact of PPS on the quality of medical care.
5. The higher-than-anticipated increase in the experiences of the diagnostic mix in the DRG system.
6. The appropriateness of outlier payments, and the applicability of severity of illness, intensity of care, or other modifications to the DRG system.
7. The feasibility of an admissions volume adjustment.

Brandeis University Health Policy Reserch Consortium

Research Topics:

1. Relative value scales.
2. Variation in treatment patterns.
3. The advisability and feasibility of physician DRG's and other research in support of physician reimbursement reform.
4. The feasibility of eliminating separate urban and rural payment rates.
5. The method under which the excluded hospitals can be paid on a prospective basis.
6. The feasibility and desirability of an all-payer prospective payment system.
7. The effect of Medicare PPS on State Medicaid programs.

SOURCE: Personal communication by ProPAC staff with the Office of Research and Demonstrations, Health Care Financing Administration, Department of Health and Human Services, Baltimore, Maryland, March 1986.

NONMANDATED PPS-RELATED STUDIES BY THE DHHS OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION AND BY THE DHHS OFFICE OF THE INSPECTOR GENERAL

Study Topic	Period	Fundinge	Status (as of February 1986)
Office of the Assistant Secretary for Planning and Evaluation (ASPE):			
1. Policy Analysis Needs for Implementation of the Medicare PPS	3/84 to 10/84	$ 253,000	Complete
2. Financing of Graduate Medical Education	10/81 to 9/85	$ 4,000,000	In clearancea
3. Hospital Capital Studyd	1/84 to 9/84	$ 125,000	In clearancea
4. Feasibility Analysis to Deteimine Whether Medicare Parts A and B Can Be Linked at the Carrier and Intermediary Levelsd	7/84 to 2/85	$ 143,000	Complete
5. Project To Monitor Impact of Hospital Prospective Payment on Long-Term Cared	6/84 to 3/85	$ 125,000	Complete (1/86)
6. Analysis of Medical and Hospital Utilization Review in the Private Sector	Proposed fiscal yeai 1986	$ 350,000 (est.)	--
7. Effects of PPS on Hospital Decisions Regarding Capital Investment	Proposed fiscal yeai 1987	Intramural	--
Office of the Inspector General (OIG):			
1. The Prospective Payment System and the (DHHS) Office of the Inspector General	3/84	Intramural	Complete
2. Medicare Reimbursement for DRG #469	Ending 11/18/83	Intramural	Complete
3. Overpayment for Lens Procedures	Ending 7/20/84	Intramural	Complete
4. Overpayment for Coronary Procedures	Ending 6/7/84	Intramural	Complete
5. Inappropriate Readmissions and Transfer Practices Under the PPS	Ending 10/23/84	Intramural	Complete
6. Overpayment for Cardiac Arrest	Ending 12/20/84	Intramural	Complete
7. Overpayment for Nail Removals	Ending 1/28/85	Intramural	Complete
8. Memo on Capital	Ending 5/85	Intramural	Complete
a. Correct computation of Medicare program gains from sales of hospitals and skilled nursing homes could save millions			
b. Need to limit the reevaluation of assets after sale of hospitals			
c. Areas for consideration in developing iecommendations reimbursing hospital capital cost under the Medicare PPS			
d. closing loophole on hospital interest income			
e. Closing another loophole on hospital interest income: interest from donated funds			
f. Medicare allowance of depreciation on assets financed with Federal funds			
g. Reducing DRG rates for capital costs could save billions			
h. Rates for capital costs: estimated minimum salvage value on depreciable assets			
9. Large profits earned by hospitals under PPS	Ending 8/85	Intramural	Complete
10. Assessment of Peer Review Organizations	Planned FY 86-87	Intramural	--
11. Medicare as a Secondary Payment Source (Third Party Liability)	Planned FY 86-87	Intramural	--

Study Topic	Period	Funding[c]	Status (as of February 1986)
12. Part A/B Match	Planned FY 86-87	Intramural	--
13. Medicare Coverage and Reimbursement for Parenteral and Enteral Therapies	Planned FY 86-87	Intramural	--
14. Third-Party Liability for Cardiac Pacemakers and Related Devices	Planned FY 86-87	Intramural	--
15. DRG Inspections			
a. Vulnerable DRGs (#14, #82, #88, and others that show upcoding potential and significant case-mix changes)	FY 1985	Intramural	In clearance[a]
b. Vulnerable DRGs (#424, #467, #461, #87, #150, and #121	Planned FY 86-87	Intramural	--
c. Wound debridement (recognized by the Grouper program as an OR procedure but can be done at the bedside	Planned FY 86-87	Intramural	--
d. One-day stays (may represent unnecessary admissions	Planned FY 86-87	Intramural	--
e. Outpatient surgery admitted for complication of surgery	Planned FY 86-87	Intramural	--
f. Evaluation of PRO Admission Review and DRG Validation	Planned FY 85-87	Intramural	--
g. DRG Validation in Hospital Selected on a Statistically Valid Basis	Planned FY 86-87	Intramural	--
h. Inappropriate Utilization Reivew Notices Given Medicare Beneficiaries	Planned FY 86-87	Intramural	--
i. Inappropriate Discharges and Transfers under PPS	Planned FY 86-87	Intramural	--
j. Hospital Practices Under PPS	Planned FY 86-87	Intramural	--
k. Effect of PPS Implementation on the Health Care Industry	Planned FY 86-87	Intramural	--
16. Special Policy Analyses			
a. Part B Reasonable Charge Levels for Intraocular Lenses	10/84 to 9/85	Intramural	Complete
b. Assistants at Cataract/Intraocular Lens Implant Surgery at Teaching Hospitals	10/84 to 9/85	Intramural	In process
c. Anesthesiology During Intraocular Lens Surgery	10/84 to 9/85	Intramural	In process

SOURCE: Personal communications by ProPAC staff with ASPE and OIG, February 1986.

NONMANDATED PPS-RELATED STUDIES BY PUBLIC HEALTH SERVICE AGENCIES

Study Topic	Period	Funding[c]	Status (as of February 1986)
National Center for Health Services Research and Health Care Technology Assessment (NCHSR & HCTA):			
1. Impact of "Per-Case" Versus "Per-Service" Hospital Reimbursement	9/30/79 to 9/29/83	$ 393,561	Complete
2. Marginal Cost of Hospital Output and Empty Beds	9/1/81 to 5/31/84	$ 159,235	Complete
3. Measuring Clinical Homogeneity in the Two DRG Systems	7/15/83 to 2/28/85	$ 111,945	Complete
4. Adjustment Artifacts in DRG-Based Medicare Reimbursement	9/1/84 to 8/31/85	$ 21,539	In clearance[a]
5. Trauma Case-Mix Measurement and Hospital Payment	9/30/84 to 9/29/86	$ 366,892	--
6. Impacts of the Prospective Payment System on Clinical Cancer Research (with NCI)	9/30/84 to 8/31/86	$ 706,638	--
7. Factors Related to Hospitals' Length of Stay	1/1/81 to 7/31/85	$ 680,479	Complete
8. Multihospital Systems' Strategy Structure and Performance (Effect of PPS)	9/1/84 to 8/31/86	$ 405,755	--
9. Prevention of Nonelective Hospital Readmissions	9/30/85 to 9/29/86	$ 106,159	--
10. Hospital Use Rates in Local Communities in Michigan	4/1/85 to 9/30/88	$ 65,698	--
11. Developing a Severity of Illness Classification System	9/30/81 to 3/31/87	$ 1,272,972	--
12. Cost of Capital and Capital Structure in U.S. Hospitals	9/30/84 to 9/29/86	$ 269,979	--
Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA):			
1. Effects of Prospective Hospital Payment on Acute Inpatient Care for Mental Disorders	1981 to 1984	$ 30,000	Complete
2. Evaluation of the DHHS Proposed DRGs	4/83 to 8/83	$ 9,440	Complete
3. Identification of Resource Determinants for Use in Patient Classification Systems for Prospective Payment	3/1/84 to 8/31/84	$ 10,000	Complete
4. A Comparative Analysis of Functionally Related and Diagnosis-Related Groups	5/10/84 to 3/1/85	$ 9,999	Complete
5. A Study of Patient Classification Systems for Prospective Ratesetting for Medicare Patients in General Hospital Psychiatric Units and Psychiatric Hospitals	6/30/84 to 12/19/85	$ 665,189	Complete
6. Selected Data on Psychiatric DRGs From the Commission on Professional and Hospital Activities National Sample Patient File	7/15/84 to 8/31/84	$ 9,950	Complete
7. The Use of Survival Time Analysis as a Method of Patient Classification	9/1/84 to 1/31/85	$ 9,400	Complete
8. Medicare-Medicaid Alcoholism Treatment Demonstration	9/81 to 12/86	$ 60,000	--
9. ADAMHA/WHO Project on Drug Dependence Syndrome	7/1/84 to 6/30/85	$ 68,000	In process
10. Development of Diagnostic Sourcebook and Minimum Research Criteria	1/10/85 to 10/9/85	$ 68,000	In process
11. Utilization of the Severity-of-Illness Index in Psychiatric Diagnosis	1/10/85 to 10/9/85	$ 25,000	Complete
12. A Comparison of Hospital Characteristics and MEDPAR Costs Using the GIR-Maryland Data on Mental Health Discharges	1983 to 1985	$ 32,754	--

Study Topic	Period	Funding[c]	Status (as of February 1986)
Health Resources and Services Administration (HRSA):			
1. Experience With the Section 1122 Capital Expenditure Review Program	4/9/84 to 9/30/84	$ 99,957	Complete
2. Implications of the DRG Reimbursement Methodologies on the Health Care System and Impact on Local Health Planning in the Short Term and Over the Long Term	4/84 to 7/85	NA[e]	Complete
3. Compilation and Descriptive Analysis of Major Third-Party Coverages for Health Services as Related to Health Personnel Standards	5/3/84 to 11/2/84	$ 17,614	Complete
4. Assessment of the Impact of DRGs on Changes in the Health Services Administration Function	6/18/84 to 4/17/85	$ 13,047	Incomplete
5. Prospective Payment and DRGs: Impact on the Allied Health Professions	6/29/84 to 8/14/85	$ 13,227	Incomplete
6. Impact of PPS on Medical Records Personnel	Not specified	Intramural	--
7. Best Practices of States Concerning Innovative Hospital Investment Decisions	9/30/85 to 3/31/86	$ 68,873	--
8. Use of the OHF Microsimulation Model to Evaluate the Potential Impact of the DRG System on the FHS 242 Hospitals	9/30/85 to 5/17/86	$ 81,338	--
9. Analysis of Educational Cost Reimbursement Procedures Under Medicare and Hospital Program Development Decisions	9/85 to 9/86	$ 198,269	--
10. An Assessment of State Support for Health Professions Education	9/85 to 9/96	$ 175,159	--
11. The Hospital's Role in the Clinical Education of Health Personnel (Design Study)	9/85 to 9/86	$ 59,993	--
12. Effects of PPS on Pharmacy	9/85 to 9/86	$ 17,603	--
13. Nursing Costs Model	6/85 to 6/86	$ 174,914	--
Centers for Disease Control (CDC):			
1. Effect of DRGs on Hospital Infections	1985	Intramural	In clearance[a]
2. Impact of DRG System on Diabetes-Related Hospitalizations	10/1/83 to 6/20/84	$ 8,800	Complete
Office of Health Planning and Evaluation (OHPE):			
1. Development of a Research Agenda to Explore Issues of Access and Quality of Care in the Current Health Care Environment	4/10/85 to 6/30/86	$ 132,000	--
National Center for Health Statistics (NCHS):			
1. National Data Base Re: Retrieval of National Estimates of DRGs	Ongoing	Intramural	--
2. Frequency and Average LOS of Top 20 DRGs by Age (<65 and >64), Region, and Bed Size for 1981	Not specified	Intramural	Complete
3. Frequency and Average LOS of Top 20 DRGs by Age (<65 and >64), Region, and Bed Size for 1982	Not specified	Intramural	Complete
4. Frequency and Average LOS for all DRGs from 1980 to 1984	Not specified	Intramural	In clearance[a]

SOURCE: "Public Health Service Prospective Payment Activity as of 9/30/85" (Report) and personal communications by ProPAC staff with NCHSR, ADAMHA, HRSA, and NCHS, February 1986.

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Study Topic	Due Date	Status (as of February 1986)
OFFICE OF TECHNOLOGY ASSESSMENT		
1. Diagnosis Related Groups (DRGs) and the Medicare Program: Implications for Medical Technology (A Technical Memorandum)	July 1983	Complete
2. Medical Technology and Costs of the Medicare Program (OTA Report)	July 1984	Complete
3. Federal Policies and the Medical Devices Industry	October 1984	Complete
4. Evaluation of HCFA's Part A Data Base (A Staff Memorandum)	October 1984	Complete
5. Technology and Aging in America	June 1985	Complete
6. Medicare's Prospective Payment System. Strategies for Evaluating Cost, Quality,and Medical Technology	October 1985	Complete
7. Payment for Physician Services: Strategies for Medicare	February 1986	Complete
CONGRESSIONAL BUDGET OFFICE		
1. Impact of Medicare Prospective Payment System on Disproportionate Share Hospitals (Staff Memorandum)	November 1984	Complete
2. An Analysis of the Impacts of a DRG-Specific Price Blending Option for Medicare's Prospective Payment System (Staff Analysis)	December 1984	Complete
3. Medicare Prospective Payment System Issues and Short-Term Options	Fiscal Year 86	In process
CONGRESSIONAL RESEARCH SERVICE		
1. Medicare: Prospective Payment for Inpatient Hospital Services (Issue Brief)	--	Updated regularly
2. Medicare: Physician Payments (Issue Brief)	--	Updated regularly
3. Medicare: FY 86 Budget (Issue Brief)		Complete
4. Payment for Medical Education under the Medicare Program (White Paper)	September 1984	Complete
5. Capital Costs under Medicare PPS for Hospitals (White Paper)	February 1984	Complete
6. Federal Funding for Health Professions Education (White Paper)	April 1985	Complete
7. Payments for Medical Education by the Medicare Program (White Paper)	May 1985	Complete
8. Medicare Payment Provisions for Disproportionate Share Hospitals (White Paper)	July 1985	Complete
9. Hospital Capital Cost Reimbursement under the Medicare Program (White Paper)	November 1985	Complete
10. Medicare: FY 87 Budget (Issue Brief)	--	Updated regularly
11. Legislative History of the Medicare Prospective Payment System	--	In progress
12. Development of a Data Base and Capacity to Model PPS	--	In progress

Study Topic	Due Date	Status (as of February 1986)
13. Specific Requests Re: PPS for Committees with Jurisdiction over PPS (confidential)	--	As requested
GENERAL ACCOUNTING OFFICE		
Ongoing Studies:		
1. Evaluation of Utilization Review Efforts for Respiratory/Inhalation Therapy (adequacy of DRG rates)	9/84	Complete
2. Survey of Utilization of Intensive Care Unit Services by Low-Risk Medicare Patients	8/85	Complete
3. Review of Medicare Reimbursements for Implanting Cardiac Pacemakers	2/85	Complete
4. Information Requirements for Evaluating the Impacts of Medicare Prospective Payment on Post-Hospital Long-Term Care Services	8/15/85	In clearance[a]
5. Survey of Patient Classification and Utilization Reviews of Nursing Homes	3/85	Complete
6. Evaluation of Medicare's Hospital Admission Monitoring Systems	11/18/85	Complete
7. Survey of Intermediary Audits of Hospital Cost Reports	8/85	Complete
8. Review of Effect on Medicare/medicaid Costs of Hospital Conversions From Nonprofit to Proprietary Status	1/86	In process
9. Survey of Unnecessary Admissions and Premature Discharges	Ongoing	--
10. Survey of Congressionally Mandated HHS Study of How to Incorporate Capital Costs Into Prospective Reimbursement	4/86	--
Planned Studies:		
11. Review of Utilization of Medically Unnecessary Hospital Days of Care by Medicare Patients		
12. Review of the Accuracy of DRG Classification by Hospitals		
13. Survey of HCFA Equitable Medicare DRG Payment Rates		
Proposed Studies:		
14. Survey of HCFA's Methodology for Calculating the Prospective Rates		
15. Survey To Assure That Medicare Beneficiaries Have Adequate Access to Care		
16. Survey of the Incidence of Unnecessary Surgery		
17. Review of the Accuracy of DRG Classification by Hospitals		
18. Survey of Improperly Allocated Costs		
19. Survey of Medicare Reimbursement for Hospital Teaching Costs		

SOURCE: Personal communication by ProPAC staff with OTA, CBO, CRS, and GAO, February 1986.

PROSPECTIVE PAYMENT ASSESSMENT COMMISSION
RESEARCH CONTRACTS

Title	Period	Funding	Status (as of (February 1986)
Fiscal Year 1985:			
1. Effects of PPS on Quality of Care	8/85 to 3/86	$43,629	
2. Hospital Market Basket Studies	9/85 to 6/86	$47,480	
3. Empirical Foundation for the Discretionary Adjustment Factor	8/85 to 3/86	$35,900	
4. Allocation of Nursing Costs	7/85 to 3/86	$37,502	
5. DRGs for Lymphomas, Leukemias, and Chemotherapy	9/85 to 3/86	$24,826	
6. PPS Payments for Heart Transplants	9/85 to 3/86	$12,431	
7. PPS Payments for Expensive Devices	9/85 to 3/86	$37,919	
8. DRGs for Cardiac Pacemakers	9/85 to 3/86	$ 8,804	
9. Measurement of Hospital's Case-Mix Index	9/85 to 3/86	$21,329	
10. Hospital Labor Market Areas and Wage Indexes	9/85 to 12/86	$209,487	
11. Geographic Variation Grants (2)	9/85 to 12/86	$50,000	
12. Measuring Real Changes in Case Mix	9/85 to 12/86	$208,450	
13. Measuring the Effects of PPS	12/85	$ 4,000	Complete
14. Hospital Managerial Strategies	9/85 to 3/86	$ 6,500	
Fiscal Year 1986:			
15. Financial Flexibility in the Hospital Industry	1/86	$ 3,000	Complete
16. Evaluation of Maryland's Per-Diem Allocation of Costs	12/85 to 3/86	$ 8,000	
17. Evaluation of HCFA's "Speed Audit" Sampling	1/86 to 4/86	$32,800	
18. Differences Between Exempt and PPS Hospitals	2/86	$14,575	Complete
19. Analysis of Selected Capital Payment Issues	1/86	$ 9,900	Complete
20. State Use of DRG-Based Systems	4/86	$ 6,500	
21. Review of PRO Quality Assessment Activities	3/86	$12,000	

SOURCE: Prospective Payment Assessment Commission, February 1986.

PPS-RELATED STUDIES BY THE DEPARTMENT OF DEFENSE

Study Topic	Period	Funding	Status (as of February 1986)
Tri-Service Performance Measurement Group; Study combining into one report research performed by Army, Nary and Air Force regarding DRG utilization in military hospitals. Includes case mix and resource allocation studies	10/85 to 9/87	Intramural	
Civilian Health and Medical Program of the Uniformed Services (CHAMPUS):			
1. CHAMPUS Implementation of DRG Reimbursement (South Carolina Demonstration)	9/1/84 to 8/31/85	Intramural	Complete

a Report has been completed and is being reviewed within DHHS before being submitted to Congress.

b Report included in larger project, "Study of Skilled Nursing Facilities Benefit Under Medicare."

c Dollar amounts represent extramural funding. Funding levels for intramural projects and projects being conducted with State waivers that permit innovations to financing and delivery of health services under Medicare are not specified.

d Directly supports one (or more) of the congressionally mandated studies of PPS.

e NA = Not available.

Organization/Study Topic	Period of Study
Provider Organizations:	
American Academy of Neurology DRG expanded survey to obtain specific data on areas of concern which surfaced in an initial survey on DRGs	3/15/85 to 6/15/85
American Academy of Ophthalmology Survey to assess impact of DRGs	1985
American Academy of Otolaryngology-Head and Neck Surgery, Inc. Request to members to report experiences, both good and bad, especially regarding quality of care	Open-ended, ongoing
American Association for Clinical Chemistry AACC Membership Survey on Impact of DRGs	Completed 5/84 and 5/85
American Association for Respiratory Therapy "Impact of Prospective Payment on Manpower Needs"	1/85 to 12/85
American College of Cardiology 1. Decision analysis of DRG payment rates relative to quality care: to determine if DRG payments are adequate to allow appropriate procedures and practices for optimal patient outcome	Ongoing
2. DRG survey to obtain physicians' perceptions and case reports on PPS effect on quality of care	Ongoing, quarterly until 1987
American College of Hospital Administrators Health Care in the 1990s: Trends and Strategies	Completed 1984
American College of Physicians Two-part questionnaire to members to identify effects of PPS and collect an information base for modifying it regarding quality of care, problematic DRGs, causes and overt manifestations of negative and positive effects of PPS	1985-Ongoing
American College of Preventive Medicine Cooperative Effort with American Medical Association	Ongoing
American Hospital Association 1. Survey on PPS qualitative survey of hospital chief executive officers' current assessments of problems and opportunities in PPS design and implementation	Quarterly
2. Annual Medicare financial survey collects quantitative data summarizing each hospital's experience with TEFRA and PPS in terms of Medicare revenues, costs, and utilization activity	Annual
3. One-time special surveys on selected PPS issues	As needed

Organization/Study Topic	Period of Study
American Lung Association and medical section of American Thoracic Society Pilot survey by questionnaire entitled, "Early Impact of the Prospective Payment System on the Pulmonary Community," to compile information on quality of patient care, length of stay, and introduction of new medical technologies	10/84 to 12/84
American Medical Association	
1. DRG Monitoring Project information assessment activity to ascertain current impact of PPS and identify possible problem areas for further study	Continuing, first report available
2. Long-term effects of PPS on quality of health care for Medicare beneficiaries (developing research proposals with Johns Hopkins University)	Not determined
American Medical Record Association	
1. "DRG Variation Analysis Study" to identify discrepancies in coding between medical record departments and PROs	1985
2. Survey on the impact of PPS on medical record	Published 5/85
American Nurses' Association "DRG Refinement for Nursing Care," describing variations in nursing care in selected DRGs; appropriateness of refining DRGs to reflect differences in nursing care requirements	9/83 to 3/85
American Occupational Therapy Association Opinion-based survey on the "Impact of Prospective Payment System on Occupational Therapists"	Completed 1985
American Osteopathic Association Collection of anecdotal information resulting from dialogue with affiliates	Ongoing
American Podiatric Medical Association Analysis of costs of care provided by podiatrists and other practitioners in 20 hospitals under DRGs and 2 in waivered States (Maryland and New Jersey); description of patterns of foot care provided by podiatrists; development of a data base on patients with foot problems treated by podiatrists	1/85 to 8/85
American Psychiatric Association The Task Force on Prospective Payment is overseeing a DRG project to: (1) check the heterogeneity of psychiatric DRG, (2) assess several variables for variance reduction, and (3) compare HCFA database (for MDC-20 and MDC-19)	1984 to 5/85
American Psychological Association	
1. Board of directors special task force on prospective payment which reviews clinical literature and current research and develops position papers	Ongoing
2. "Survey of PPS Impact on Psychologists" to analyze PPS impact on the provision of hospital services to the mentally disabled, including the use of multidisciplinary treatment teams, use of alternative settings and particular impact of PPS on the professional services of psychologists	1983-85

Organization/Study topic	Period of Study
American Society of Clinical Pathologists and the College of American Pathologists "PPS/DRG Impact Survey," to collect trend data for hospital laboratories regarding laboratory use, impacts on laboratory personnel, hospital beds, and type of contractural agreement with hospitals	1/84-Ongoing
American Society of EEG Technologists, Inc. A salary/employment status questionnaire to monitor employment trends and changes and effects of PPS on hospital setting	1985
American Society of Internal Medicine Questionnaire for incident reporting by members regarding the impact of PPS on quality of care; pressure from hospitals to discharge patients early or underutilize medically necessary tests, etc.; improvements in quality of care through more careful testing, improved communication, increased cost awareness	Ongoing
American Speech-Language-Hearing Association National survey of hospital-based members of association and others on the "Impact of Prospective Payment System on Speech-Language Pathology and Audiology Services in Hospitals" -- especially on reduction or elimination of services to inpatients	1985-Open ended
Association for the Advancement of Medical Instrumentation Survey to evaluate impact of Medicare's prospective payment system on the association's membership and programming	1985 to 1990
Association of American Medical Colleges 1. Survey on estimated Medicare revenue and expense under TEFRA and PPS, patient mix information, hosptial bed capacity, and full-time equivalent residents in training	1985
2. "The Medicare Adjustment for the Indirect Costs of Medical Education: Historical Development and Current States	Published in January 1985
Association of Community Cancer Centers "ACCC DRG Research Project" intends to study the following issues: measuring the effect of DRGs on clinical research, conventional cancer patient management, technology diffusion, cancer program development and patient outcomes	1984 -1987
Committee on Allied Health Education and Accreditation of the AMA 1. Survey on "Impact of Prospective Payment System on Clinical Education for Allied Health Students" -- completed	8/84 to 1/85
2. Survey of program directors, "Perceptions Regarding CAHEA-Accredited Programs and Their Graduates"	8/84 to 1/85

Organization/Study topic	Period of Study
Council of Medical Specialty Societies National survey of physician opinions regarding DRGs: information regarding changes under DRG system and their perceived effects on costs and quality of care; addresses physicians' ability to identify specific troublesome DRGs	Pretested 1984; Survey to be conducted Spring 1986
District of Columbia Hospital Association "The Inequity of Medicare Prospective Payment in Large Urban Areas," to document the more severe impact of PPS on hospitals in large cities relative to those in suburbs and to recommend changes in PPS to improve equity	Published 9/84
Federation of Nurses and Health Professionals Planning and opinion-based survey of members regarding quality of care and staffing ratios under PPS	Undecided
Florida Hospital Association Monitor utilization trends concurrent with introduction of PPS through quarterly hospital utilization surveys	Ongoing quarterly basis
Healthcare Financial Management Association	
1. "Description and Analysis of Medicare Prospective Price Setting Including Changes for Year Two"	September 1984
2. "Prospective Payment for Capital: The Financial Nature of Capital Allowances" (HFMA Monograph Series)	1983
3. "Regulation vs. Contract: The Future of Capital Under PPS" (HFMA Monograph Series, 1984)	1984
4. "The Financing of Hospital Capital" (HFMA Monograph Series)	1984
5. "Prospective Reimbursement for Hospital Capital Costs (HFMA Monograph Series, 1984)	1984
Health Industry Manufacturers' Association	
1. "Recalibration and Updating: A Means to Health Care Cost Control and Quality"	Published 2/84
2. Recalibration case studies for diagnostic technologies	6/85 to 12/85
3. Policy analysis of recalibration issues	5/85 to 9/85
4. "Study and Analysis of DRG Prices: Implications for Manufacturers"	Published 4/84
Hospital Research and Educational Trust (affiliated with AMA) "An Evaluation of the New Medicare Prospective Pricing System as a Cost Containment Strategy" to examine changes in case mix resulting from PPS, conduct an analysis of public general and major teaching hospitals, study changes in the style of care provided, and assess trends in readmissions to acute care hospitals and hospital discharges to nursing homes and home health agencies	

Organization/Study topic	Period of Study
Kansas Hospital Association "The State of Rural Kansas Hospitals: A Study of Hospitals in the First Congressional District of Kansas" to determine the early impacts of PPS and other Kansas payment system changes on rural hospitals in Kansas and to form a base for future impact assessments	1980-1984
Montana Hospital Association Financial impact on Montana hospitals of PPS, related to admission patterns and quality of care issues National Coalition of Burn Center Hospitals Survey of all hospitals with burn centers to determine the impact of PPS	1/83 to 9/85
National Coalition of Burn Center Hospitals Survey of all hospitals with burn centers to determine the impact of PPS	Completed 12/85
New York City Health and Hospitals Corporation "Comparison of Resource Utilization: Public and Non-Public Hospital Patients" to identify causes in length-of-stay and cost differences	1981 to 1983
Northwest Oregon Health Systems A project designed to examine the dependency status of Medicare patients at discharge before and after PPS implementation, in order to determine in what ways DRGs might be affecting quality of care to the elderly	1985 to 1986
Tennessee Hospital Association Quarterly utilization surveys	10/83-Ongoing
Washington Business Group on Health Created the Employers Prospective Payment Advisory Committee (EPPAC) to monitor ProPAC and examine impact of PPS	12/83-Ongoing
Wisconsin Hospital Association 1. Modeling of the impact of Medicare PPS, including the effect of the 4-year blend, the freeze, and the wage index revision, as requested by member hospitals	Ongoing-as required
2. Survey on Medicare discharges, days, patient charges/costs, and problem DRGs	Quarterly
Beneficiary groups and disease-specific foundations:	
American Association of Retired Persons Informal reporting by members of experience regarding admissions and discharges	1/85 to 4/85
American Diabetes Assocaition Opinion-based study to determine impact of PPS on quality of health care for persons with diabetes	1985
American Society for Parenteral and Enteral Nutrition "An Evaluation of the implication and implementation of the DRG-based Prospective Payment System on Parenteral and Enteral Nutrition Services" to provide society members with practical advice on how to function effectively and to determine if these services are equitably treated under PPS	2/84 to 5/85

Organization/Study topic	Period of Study
American Spinal Injury Association DRG-related length-of-stay allowance calculations for spinal cord injured persons to attempt to get exemption status for these patients	Completed 9/84
Burn Foundation Assessment of the applicability of several case-mix indices to burn care, specifically to improve categorization of burn patients regarding severity level	NA
Cystic Fibrosis Foundation "Differential Resource Use Study," to study relative allocation of treating cystic fibrosis patients compared with caring for other patients in the same DRGs	6/84 to present
National Association of Area Agencies on Aging "Effects of Medicare Prospective Payment System on Community Based Long Term Care" to see if there has been an increased need and/or utilization of home health, chore, home-delivered meals, etc. and to assess if adequate community-based services are availble to meet increased needs	1985
National Hemophilia Foundation DRG Data Collection Project	10/84 to 9/85
General Purpose Foundations:	
The Commonwealth Fund	
1. Task Force on Academic Health Centers Program of Reports to examine conventional wisdom about effects of major public policies (including PPS) on academic health centers including control of size and content of graduate medical education programs, future financing of teaching hospitals, role of academic health centers in caring for the poor, role of teaching hospitals in technological change, and the diversity among academic health centers (Grant awarded to Johns Hopkins Hospital)	11/15/83 to 7/14/85
2. Examining the effects of Medicaid and Medicare financing and delivery innovations to evaluate Arizona's new Medicaid program, California's new Medicaid program, New York's new hospital payment program, and nationwide Medicare cost limits on hospitals as models for future structure of Medicare and Medicaid (Grant awarded to Brandeis University, University Health Policy Consortium)	12/1/82 to 4/30/85
W. K. Kellogg Foundation	
1. "Study of DRGs to improve quality and cost-effectiveness of inpatient care." The project will include consideration of the differences in levels of nursing care needed, costs for alternative forms of care, use of all hospital resources and the development of educational programs for staff to improve cost-effective care (Grant awarded to Northwestern Memorial Hospital)	1984 to 1987
2. "Rural Hospital Project" in states of Washington, Alaska, Montana, and Idaho. Project is designed to assist selected rural hospitals to improve their overall performance and stability and at the same time, increase the understanding of the complex dynamics of rural health care systems in general (Grant awarded to University of Washington Department of Family Medicine)	1984 - 1989

Organization/Study topic	Period of Study
The Medical Trust c/o Glenmede (PEW) "State of the Art in Severity of Illness" to determine which severity-of-illness measure best explains the cost differential between teaching and nonteaching hospitals, including costs per case, costs per day, utilization of ancillary services, and average length of stay within the same DRG; which measure is a better predictor of cost rather than ratio of cost to charge (Conducted by New York University Medical Center)	2/85 to 2/87
Pew Memorial Trust	
1. "Planning for the Future of Burn Care Under Prospective Reimbursement" (See Burn Foundation)	9/84 to 12/85
2. "Children's Hospitals' Case-Mix Classification System Project" to determine whether and how DRGs in their present or modified form or some other case-mix system should be incorporated into a prospective payment system for children's hospitals (Conducted by National Association of Children's Hospitals)	6/84 to 9/85
3. A study to investigate the organizational and character changes that have occurred within and between community-based agencies and institutions providing care for the elderly as a result of the implementation of the Medicare payment policy (Grant awarded with Robert Wood Johnson Foundation to Institute for Health and Aging at the University of California, San Francisco)	1985 to 1988
Robert Wood Johnson Foundation Evaluation of the Impact of New Jersey Reimbursement System on Hospital Operations and Medical Practice	4/3/83 to 6/86

Appendix E

Medicare Diagnosis-Related Groups and Weights for Fiscal Year 1986

Appendix E

Medicare Diagnosis-Related Groups and Weights for Fiscal Year 1986

DRG	MDC			TITLE	RELATIVE WEIGHTS
1	1	SURG		CRANIOTOMY AGE >17 EXCEPT FOR TRAUMA	3.5632
2	1	SURG		CRANIOTOMY FOR TRAUMA AGE >17	3.8117
3	1	SURG	*	CRANIOTOMY AGE <18	2.9183
4	1	SURG		SPINAL PROCEDURES	2.7300
5	1	SURG		EXTRACRANIAL VASCULAR PROCEDURES	1.6510
6	1	SURG		CARPAL TUNNEL RELEASE	0.4072
7	1	SURG		PERIPH + CRANIAL NERVE + OTHER NERVOUS SYST PROC AGE >69 AND/OR C.C.	1.3867
8	1	SURG		PERIPH + CRANIAL NERVE + OTHER NERVOUS SYST PROC AGE <70 W/O C.C.	0.7466
9	1	MED		SPINAL DISORDERS + INJURIES	1.4237
10	1	MED		NERVOUS SYSTEM NEOPLASMS AGE >69 AND/OR C.C.	1.1324
11	1	MED		NERVOUS SYSTEM NEOPLASMS AGE <70 W/O C.C.	0.9338
12	1	MED		DEGENERATIVE NERVOUS SYSTEM DISORDERS	1.0016
13	1	MED		MULTIPLE SCLEROSIS + CEREBELLAR ATAXIA	0.9789
14	1	MED		SPECIFIC CEREBROVASCULAR DISORDERS EXCEPT TIA	1.3144
15	1	MED		TRANSIENT ISCHEMIC ATTACK AND PRECEREBRAL OCCLUSIONS	0.6241
16	1	MED		NONSPECIFIC CEREBROVASCULAR DISORDERS WITH C.C.	0.9044
17	1	MED		NONSPECIFIC CEREBROVASCULAR DISORDERS W/O C.C.	0.6803
18	1	MED		CRANIAL + PERIPHERAL NERVE DISORDERS AGE >69 AND/OR C.C.	0.7567
19	1	MED		CRANIAL + PERIPHERAL NERVE DISORDERS AGE <70 W/O C.C.	0.6548
20	1	MED		NERVOUS SYSTEM INFECTION EXCEPT VIRAL MENINGITIS	1.4090
21	1	MED		VIRAL MENINGITIS	1.3144
22	1	MED		HYPERTENSIVE ENCEPHALOPATHY	0.7087
23	1	MED		NONTRAUMATIC STUPOR + COMA	1.1242
24	1	MED		SEIZURE + HEADACHE AGE >69 AND/OR C.C.	0.7644
25	1	MED		SEIZURE + HEADACHE AGE 18-69 W/O C.C.	0.5522
26	1	MED		SEIZURE + HEADACHE AGE 0-17	0.6255
27	1	MED		TRAUMATIC STUPOR + COMA, COMA >1 HR	1.5648
28	1	MED		TRAUMATIC STUPOR + COMA, COMA <1 HR AGE >69 AND/OR C.C.	0.9422
29	1	MED		TRAUMATIC STUPOR + COMA <1 HR AGE 18-69 W/O C.C.	0.6462
30	1	MED	*	TRAUMATIC STUPOR + COMA <1 HR AGE 0-17	0.3539

* Medicare data have been supplemented by data from Maryland and Michigan for low volume DRGs.

DRG	MDC		TITLE	RELATIVE WEIGHTS
31	1	MED	CONCUSSION AGE >69 AND/OR C.C.	0.5383
32	1	MED	CONCUSSION AGE 18-69 W/O C.C.	0.4064
33	1	MED *	CONCUSSION AGE 0-17	0.2457
34	1	MED	OTHER DISORDERS OF NERVOUS SYSTEM AGE >69 AND/OR C.C.	0.9777
35	1	MED	OTHER DISORDERS OF NERVOUS SYSTEM AGE <70 W/O C.C.	0.7384
36	2	SURG	RETINAL PROCEDURES	0.7103
37	2	SURG	ORBITAL PROCEDURES	0.6688
38	2	SURG	PRIMARY IRIS PROCEDURES	0.3990
39	2	SURG	LENS PROCEDURES WITH OR WITHOUT VITRECTOMY	0.5721
40	2	SURG	EXTRAOCULAR PROCEDURES EXCEPT ORBIT AGE >17	0.4129
41	2	SURG *	EXTRAOCULAR PROCEDURES EXCEPT ORBIT AGE 0-17	0.3657
42	2	SURG	INTRAOCULAR PROCEDURES EXCEPT RETINA, IRIS + LENS	0.6543
43	2	MED	HYPHEMA	0.3462
44	2	MED	ACUTE MAJOR EYE INFECTIONS	0.6397
45	2	MED	NEUROLOGICAL EYE DISORDERS	0.5409
46	2	MED	OTHER DISORDERS OF THE EYE AGE >17 WITH C.C.	0.6010
47	2	MED	OTHER DISORDERS OF THE EYE AGE >17 W/O C.C.	0.4192
48	2	MED *	OTHER DISORDERS OF THE EYE AGE 0-17	0.4018
49	3	SURG	MAJOR HEAD + NECK PROCEDURES	2.8745
50	3	SURG	SIALOADENECTOMY	0.7034
51	3	SURG	SALIVARY GLAND PROCEDURES EXCEPT SIALOADENECTOMY	0.5887
52	3	SURG	CLEFT LIP + PALATE REPAIR	0.6956
53	3	SURG	SINUS + MASTOID PROCEDURES AGE >17	0.6176
54	3	SURG *	SINUS + MASTOID PROCEDURES AGE 0-17	0.6889
55	3	SURG	MISCELLANEOUS EAR, NOSE + THROAT PROCEDURES	0.4342
56	3	SURG	RHINOPLASTY	0.4358
57	3	SURG	T+A PROC EXCEPT TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY AGE >17	0.7718
58	3	SURG *	T+A PROC EXCEPT TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY AGE 0-17	0.3097
59	3	SURG	TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY AGE >17	0.4132
60	3	SURG *	TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY AGE 0-17	0.2616

* Medicare data have been supplemented by data from Maryland and Michigan for low volume DRGs.

DRG	MDC		TITLE	RELATIVE WEIGHTS
61	3	SURG	MYRINGOTOMY WITH TUBE INSERTION AGE >17	0.4274
62	3	SURG *	MYRINGOTOMY WITH TUBE INSERTION AGE 0-17	0.3089
63	3	SURG	OTHER EAR, NOSE + THROAT O.R. PROCEDURES	1.1619
64	3	MED	EAR, NOSE + THROAT MALIGNANCY	0.9769
65	3	MED	DYSEQUILIBRIUM	0.4499
66	3	MED	EPISTAXIS	0.4146
67	3	MED	EPIGLOTTITIS	0.9364
68	3	MED	OTITIS MEDIA + URI AGE >69 AND/OR C.C.	0.6092
69	3	MED	OTITIS MEDIA + URI AGE 18-69 W/O C.C.	0.5040
70	3	MED	OTITIS MEDIA + URI AGE 0-17	0.5251
71	3	MED	LARYNGOTRACHEITIS	0.6594
72	3	MED	NASAL TRAUMA + DEFORMITY	0.5217
73	3	MED	OTHER EAR, NOSE + THROAT DIAGNOSES AGE >17	0.6049
74	3	MED *	OTHER EAR, NOSE + THROAT DIAGNOSES AGE 0-17	0.3427
75	4	SURG	MAJOR CHEST PROCEDURES	2.9780
76	4	SURG	OTHER RESPIRATORY SYSTEM O.R. PROCEDURES WITH C.C.	2.5667
77	4	SURG	OTHER RESPIRATORY SYSTEM O.R. PROCEDURES W/O C.C.	1.6735
78	4	MED	PULMONARY EMBOLISM	1.4802
79	4	MED	RESPIRATORY INFECTIONS + INFLAMMATIONS AGE >69 AND/OR C.C.	1.9546
80	4	MED	RESPIRATORY INFECTIONS + INFLAMMATIONS AGE 18-69 W/O C.C.	1.4403
81	4	MED *	RESPIRATORY INFECTIONS + INFLAMMATIONS AGE 0-17	0.8652
82	4	MED	RESPIRATORY NEOPLASMS	1.1259
83	4	MED	MAJOR CHEST TRAUMA AGE >69 AND/OR C.C.	0.8398
84	4	MED	MAJOR CHEST TRAUMA AGE <70 W/O C.C.	0.5921
85	4	MED	PLEURAL EFFUSION AGE >69 AND/OR C.C.	1.1198
86	4	MED	PLEURAL EFFUSION AGE <70 W/O C.C.	0.9761
87	4	MED	PULMONARY EDEMA + RESPIRATORY FAILURE	1.8078
88	4	MED	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	1.0769
89	4	MED	SIMPLE PNEUMONIA + PLEURISY AGE >69 AND/OR C.C.	1.1768
90	4	MED	SIMPLE PNEUMONIA + PLEURISY AGE 18-69 W/O C.C.	0.8900

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DRG	MDC		TITLE	RELATIVE WEIGHTS
91	4	MED	SIMPLE PNEUMONIA + PLEURISY AGE 0-17	0.8216
92	4	MED	INTERSTITIAL LUNG DISEASE AGE >69 AND/OR C.C.	1.1117
93	4	MED	INTERSTITIAL LUNG DISEASE AGE <70 W/O C.C.	0.8642
94	4	MED	PNEUMOTHORAX AGE >69 AND/OR C.C.	1.3044
95	4	MED	PNEUMOTHORAX AGE <70 W/O C.C.	0.8797
96	4	MED	BRONCHITIS + ASTHMA AGE >69 AND/OR C.C.	0.8448
97	4	MED	BRONCHITIS + ASTHMA AGE 18-69 W/O C.C.	0.7092
98	4	MED	BRONCHITIS + ASTHMA AGE 0-17	0.7202
99	4	MED	RESPIRATORY SIGNS + SYMPTOMS AGE >69 AND/OR C.C.	0.8078
100	4	MED	RESPIRATORY SIGNS + SYMPTOMS AGE <70 W/O C.C.	0.6255
101	4	MED	OTHER RESPIRATORY SYSTEM DIAGNOSES AGE >69 AND/OR C.C.	0.8461
102	4	MED	OTHER RESPIRATORY SYSTEM DIAGNOSES AGE <70	0.6843
103	5	SURG	HEART TRANSPLANT	0.0000
104	5	SURG	CARDIAC VALVE PROCEDURE WITH PUMP + WITH CARDIAC CATH	7.3161
105	5	SURG	CARDIAC VALVE PROCEDURE WITH PUMP + W/O CARDIAC CATH	6.3400
106	5	SURG	CORONARY BYPASS WITH CARDIAC CATH	5.3332
107	5	SURG	CORONARY BYPASS W/O CARDIAC CATH	4.6614
108	5	SURG	OTHER CARDIOVASCULAR OR THORACIC PROC, WITH PUMP	4.7810
109	5	SURG	CARDIOTHORACIC PROCEDURES W/O PUMP	4.3597
110	5	SURG	MAJOR RECONSTRUCTIVE VASCULAR PROC W/O PUMP AGE >69 AND/OR C.C.	3.3215
111	5	SURG	MAJOR RECONSTRUCTIVE VASCULAR PROC W/O PUMP AGE <70 W/O C.C.	2.4581
112	5	SURG	VASCULAR PROCEDURES EXCEPT MAJOR RECONSTRUCTION W/O PUMP	2.2239
113	5	SURG	AMPUTATION FOR CIRCULATORY SYSTEM DISORDERS EXCEPT UPPER LIMB + TOE	2.5406
114	5	SURG	UPPER LIMB + TOE AMPUTATION FOR CIRC SYSTEM DISORDERS	1.8946
115	5	SURG	PERMANENT CARDIAC PACEMAKER IMPLANT WITH AMI, HEART FAILURE, OR SHOCK	4.1634
116	5	SURG	PERMANENT CARDIAC PACEMAKER IMPLANT W/O AMI, HEART FAILURE, OR SHOCK	2.9709
117	5	SURG	CARDIAC PACEMAKER REPLACE + REVIS EXC PULSE GEN REPL ONLY	1.4684
118	5	SURG	CARDIAC PACEMAKER PULSE GENERATOR REPLACEMENT ONLY	1.8784
119	5	SURG	VEIN LIGATION + STRIPPING	0.9165
120	5	SURG	OTHER CIRCULATORY SYSTEM O.R. PROCEDURES	2.2580

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DRG	MDC		TITLE	RELATIVE WEIGHTS
121	5	MED	CIRCULATORY DISORDERS WITH AMI + C.V. COMP., DISCHARGED ALIVE	1.7694
122	5	MED	CIRCULATORY DISORDERS WITH AMI W/O C.V. COMP., DISCHARGED ALIVE	1.3270
123	5	MED	CIRCULATORY DISORDERS WITH AMI, EXPIRED	1.3525
124	5	MED	CIRCULATORY DISORDERS EXC AMI WITH CARD CATH + COMPLEX DIAGNOSIS	1.2553
125	5	MED	CIRCULATORY DISORDERS EXC AMI WITH CARD CATH W/O COMPLEX DIAGNOSIS	0.7266
126	5	MED	ACUTE + SUBACUTE ENDOCARDITIS	2.9840
127	5	MED	HEART FAILURE + SHOCK	1.0100
128	5	MED	DEEP VEIN THROMBOPHLEBITIS	0.8456
129	5	MED	CARDIAC ARREST, UNEXPLAINED	1.7200
130	5	MED	PERIPHERAL VASCULAR DISORDERS AGE >69 AND/OR C.C.	0.8254
131	5	MED	PERIPHERAL VASCULAR DISORDERS AGE <70 W/O C.C.	0.6712
132	5	MED	ATHEROSCLEROSIS AGE >69 AND/OR C.C.	0.8040
133	5	MED	ATHEROSCLEROSIS AGE <70 W/O C.C.	0.7050
134	5	MED	HYPERTENSION	0.6365
135	5	MED	CARDIAC CONGENITAL + VALVULAR DISORDERS AGE >69 AND/OR C.C.	0.8936
136	5	MED	CARDIAC CONGENITAL + VALVULAR DISORDERS AGE 18-69 W/O C.C.	0.7526
137	5	MED	* CARDIAC CONGENITAL + VALVULAR DISORDERS AGE 0-17	0.6315
138	5	MED	CARDIAC ARRHYTHMIA + CONDUCTION DISORDERS AGE >69 AND/OR C.C.	0.8138
139	5	MED	CARDIAC ARRHYTHMIA + CONDUCTION DISORDERS AGE <70 W/O C.C.	0.6517
140	5	MED	ANGINA PECTORIS	0.6895
141	5	MED	SYNCOPE + COLLAPSE AGE >69 AND/OR C.C.	0.6188
142	5	MED	SYNCOPE + COLLAPSE AGE <70 W/O C.C.	0.5335
143	5	MED	CHEST PAIN	0.5895
144	5	MED	OTHER CIRCULATORY SYSTEM DIAGNOSES WITH C.C.	1.1158
145	5	MED	OTHER CIRCULATORY SYSTEM DIAGNOSES W/O C.C.	0.8477
146	6	SURG	RECTAL RESECTION AGE >69 AND/OR C.C.	3.0755
147	6	SURG	RECTAL RESECTION AGE <70 W/O C.C.	2.2737
148	6	SURG	MAJOR SMALL + LARGE BOWEL PROCEDURES AGE >69 AND/OR C.C.	2.9407
149	6	SURG	MAJOR SMALL + LARGE BOWEL PROCEDURES AGE <70 W/O C.C.	2.1072
150	6	SURG	PERITONEAL ADHESIOLYSIS AGE >69 AND/OR C.C.	2.3428

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DRG	MDC		TITLE	RELATIVE WEIGHTS
151	6	SURG	PERITONEAL ADHESIOLYSIS AGE <70 W/O C.C.	1.5902
152	6	SURG	MINOR SMALL + LARGE BOWEL PROCEDURES AGE >69 AND/OR C.C.	1.4069
153	6	SURG	MINOR SMALL + LARGE BOWEL PROCEDURES AGE <70 W/O C.C.	1.0993
154	6	SURG	STOMACH, ESOPHAGEAL + DUODENAL PROCEDURES AGE >69 AND/OR C.C.	2.6880
155	6	SURG	STOMACH, ESOPHAGEAL + DUODENAL PROCEDURES AGE 18-69 W/O C.C.	1.7906
156	6	SURG *	STOMACH, ESOPHAGEAL + DUODENAL PROCEDURES AGE 0-17	0.8382
157	6	SURG	ANAL AND STONAL PROCEDURES AGE >69 AND/OR C.C.	0.7302
158	6	SURG	ANAL AND STONAL PROCEDURES AGE <70 W/O C.C.	0.5513
159	6	SURG	HERNIA PROCEDURES EXCEPT INGUINAL + FEMORAL AGE >69 AND/OR C.C.	1.0000
160	6	SURG	HERNIA PROCEDURES EXCEPT INGUINAL + FEMORAL AGE 18-69 W/O C.C.	0.7457
161	6	SURG	INGUINAL + FEMORAL HERNIA PROCEDURES AGE >69 AND/OR C.C.	0.6538
162	6	SURG	INGUINAL + FEMORAL HERNIA PROCEDURES AGE 18-69 W/O C.C.	0.5264
163	6	SURG	HERNIA PROCEDURES AGE 0-17	0.9648
164	6	SURG	APPENDECTOMY WITH COMPLICATED PRINCIPAL DIAGNOSIS AGE >69 AND/OR C.C.	2.0649
165	6	SURG	APPENDECTOMY WITH COMPLICATED PRINCIPAL DIAGNOSIS AGE <70 W/O C.C.	1.4379
166	6	SURG	APPENDECTOMY W/O COMPLICATED PRINCIPAL DIAGNOSIS AGE >69 AND/OR C.C.	1.3606
167	6	SURG	APPENDECTOMY W/O COMPLICATED PRINCIPAL DIAGNOSIS AGE <70 W/O C.C.	0.8855
168	6	SURG	MOUTH PROCEDURES AGE >69 AND/OR C.C.	0.9188
169	6	SURG	MOUTH PROCEDURES AGE <70 W/O C.C.	0.6585
170	6	SURG	OTHER DIGESTIVE SYSTEM PROCEDURES AGE >69 AND/OR C.C.	2.7615
171	6	SURG	OTHER DIGESTIVE SYSTEM PROCEDURES AGE <70 W/O C.C.	2.3305
172	6	MED	DIGESTIVE MALIGNANCY AGE >69 AND/OR C.C.	1.0749
173	6	MED	DIGESTIVE MALIGNANCY AGE <70 W/O C.C.	0.9604
174	6	MED	G.I. HEMORRHAGE AGE >69 AND/OR C.C.	0.9075
175	6	MED	G.I. HEMORRHAGE AGE <70 W/O C.C.	0.7069
176	6	MED	COMPLICATED PEPTIC ULCER	0.9318
177	6	MED	UNCOMPLICATED PEPTIC ULCER AGE >69 AND/OR C.C.	0.6617
178	6	MED	UNCOMPLICATED PEPTIC ULCER AGE <70 W/O C.C.	0.5556
179	6	MED	INFLAMMATORY BOWEL DISEASE	0.9877
180	6	MED	G.I. OBSTRUCTION AGE >69 AND/OR C.C.	0.7584

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DRG	MDC		TITLE	RELATIVE WEIGHTS
181	6	MED	G.I. OBSTRUCTION AGE <70 W/O C.C.	0.5828
182	6	MED	ESOPHAGITIS, GASTROENTERITIS + MISC DIGEST DIS AGE >69 AND/OR C.C.	0.6034
183	6	MED	ESOPHAGITIS, GASTROENTERITIS + MISC DIGEST DIS AGE 18-69 W/O C.C.	0.5107
184	6	MED	ESOPHAGITIS, GASTROENTERITIS + MISC DIGEST DISORDERS AGE 0-17	0.4828
185	6	MED	DENTAL + ORAL DISEASE EXCEPT EXTRACTIONS + RESTORATIONS AGE >17	0.7147
186	6	MED	* DENTAL + ORAL DISEASE EXCEPT EXTRACTIONS + RESTORATIONS AGE 0-17	0.4112
187	6	MED	DENTAL EXTRACTIONS + RESTORATIONS	0.4211
188	6	MED	OTHER DIGESTIVE SYSTEM DIAGNOSES AGE >69 AND/OR C.C.	0.7173
189	6	MED	OTHER DIGESTIVE SYSTEM DIAGNOSES AGE 18-69 W/O C.C.	0.5272
190	6	MED	OTHER DIGESTIVE SYSTEM DIAGNOSES AGE 0-17	0.9178
191	7	SURG	MAJOR PANCREAS, LIVER + SHUNT PROCEDURES	4.4608
192	7	SURG	MINOR PANCREAS, LIVER + SHUNT PROCEDURES	4.0442
193	7	SURG	BILIARY TRACT PROC EXC TOT CHOLECYSTECTOMY AGE >69 AND/OR C.C.	2.8120
194	7	SURG	BILIARY TRACT PROC EXC TOT CHOLECYSTECTOMY AGE <70 W/O C.C.	2.1206
195	7	SURG	TOTAL CHOLECYSTECTOMY WITH C.D.E. AGE >69 AND/OR C.C.	2.2727
196	7	SURG	TOTAL CHOLECYSTECTOMY WITH C.D.E. AGE <70 W/O C.C.	1.5976
197	7	SURG	TOTAL CHOLECYSTECTOMY W/O C.D.E. AGE >69 AND/OR C.C.	1.7058
198	7	SURG	TOTAL CHOLECYSTECTOMY W/O C.D.E. AGE <70 W/O C.C.	1.1400
199	7	SURG	HEPATOBILIARY DIAGNOSTIC PROCEDURE FOR MALIGNANCY	2.3378
200	7	SURG	HEPATOBILIARY DIAGNOSTIC PROCEDURE FOR NON-MALIGNANCY	2.6286
201	7	SURG	OTHER HEPATOBILIARY OR PANCREAS O.R. PROCEDURES	2.7130
202	7	MED	CIRRHOSIS + ALCOHOLIC HEPATITIS	1.1665
203	7	MED	MALIGNANCY OF HEPATOBILIARY SYSTEM OR PANCREAS	1.0339
204	7	MED	DISORDERS OF PANCREAS EXCEPT MALIGNANCY	0.9703
205	7	MED	DISORDERS OF LIVER EXC MALIG, CIRR, ALC HEPA AGE >69 AND/OR C.C.	1.0720
206	7	MED	DISORDERS OF LIVER EXC MALIG, CIRR, ALC HEPA AGE <70 W/O C.C.	0.7735
207	7	MED	DISORDERS OF THE BILIARY TRACT AGE >69 AND/OR C.C.	0.7775
208	7	MED	DISORDERS OF THE BILIARY TRACT AGE <70 W/O C.C.	0.5794
209	8	SURG	MAJOR JOINT AND LIMB REATTACHMENT PROCEDURES	2.3930
210	8	SURG	HIP + FEMUR PROCEDURES EXCEPT MAJOR JOINT AGE >69 AND/OR C.C.	2.0320

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DRG	MDC		TITLE	RELATIVE WEIGHTS
211	8	SURG	HIP + FEMUR PROCEDURES EXCEPT MAJOR JOINT AGE 18-69 W/O C.C.	1.7867
212	8	SURG	HIP + FEMUR PROCEDURES EXCEPT MAJOR JOINT AGE 0-17	1.6609
213	8	SURG	AMPUTATIONS FOR MUSCULOSKELETAL SYSTEM + CONNECTIVE TISSUE DISORDERS	1.9753
214	8	SURG	BACK + NECK PROCEDURES AGE >69 AND/OR C.C.	1.8776
215	8	SURG	BACK + NECK PROCEDURES AGE <70 W/O C.C.	1.4281
216	8	SURG	BIOPSIES OF MUSCULOSKELETAL SYSTEM + CONNECTIVE TISSUE	1.5566
217	8	SURG	WND DEBRID + SKN GRFT EXC HAND FOR MUSCULOSKELETAL + CONN TISS DIS	2.3100
218	8	SURG	LOWER EXTREM + HUMER PROC EXC HIP, FOOT, FEMUR AGE >69 AND/OR C.C.	1.3798
219	8	SURG	LOWER EXTREM + HUMER PROC EXC HIP, FOOT, FEMUR AGE 18-69 W/O C.C.	1.0437
220	8	SURG *	LOWER EXTREM + HUMER PROC EXC HIP, FOOT, FEMUR AGE 0-17	0.9242
221	8	SURG	KNEE PROCEDURES AGE >69 AND/OR C.C.	0.9758
222	8	SURG	KNEE PROCEDURES AGE <70 W/O C.C.	0.7113
223	8	SURG	UPPER EXTREMITY PROC EXC HUMERUS + HAND AGE >69 AND/OR C.C.	0.9853
224	8	SURG	UPPER EXTREMITY PROC EXC HUMERUS + HAND AGE <70 W/O C.C.	0.7891
225	8	SURG	FOOT PROCEDURES	0.6520
226	8	SURG	SOFT TISSUE PROCEDURES AGE >69 AND/OR C.C.	0.9811
227	8	SURG	SOFT TISSUE PROCEDURES AGE <70 W/O C.C.	0.6872
228	8	SURG	GANGLION (HAND) PROCEDURES	0.3661
229	8	SURG	HAND PROCEDURES EXCEPT GANGLION	0.6212
230	8	SURG	LOCAL EXCISION + REMOVAL OF INT FIX DEVICES OF HIP + FEMUR	1.0555
231	8	SURG	LOCAL EXCISION + REMOVAL OF INT FIX DEVICES EXCEPT HIP + FEMUR	0.7516
232	8	SURG	ARTHROSCOPY	0.6706
233	8	SURG	OTHER MUSCULOSKELET SYS + CONN TISS O.R. PROC AGE >69 AND/OR C.C.	1.3723
234	8	SURG	OTHER MUSCULOSKELET SYS + CONN TISS O.R. PROC AGE <70 W/O C.C.	0.9457
235	8	MED	FRACTURES OF FEMUR	1.4137
236	8	MED	FRACTURES OF HIP + PELVIS	1.0714
237	8	MED	SPRAINS, STRAINS + DISLOCATIONS OF HIP, PELVIS + THIGH	0.6049
238	8	MED	OSTEOMYELITIS	1.6470
239	8	MED	PATHOLOGICAL FRACTURES + MUSCULOSKELETAL + CONN TISS MALIGNANCY	0.9272
240	8	MED	CONNECTIVE TISSUE DISORDERS AGE >69 AND/OR C.C.	0.9049

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DRG	MDC			TITLE	RELATIVE WEIGHTS
241	8	MED		CONNECTIVE TISSUE DISORDERS AGE <70 W/O C.C.	0.7492
242	8	MED		SEPTIC ARTHRITIS	1.4562
243	8	MED		MEDICAL BACK PROBLEMS	0.6843
244	8	MED		BONE DISEASES + SPECIFIC ARTHROPATHIES AGE >69 AND/OR C.C.	0.6748
245	8	MED		BONE DISEASES + SPECIFIC ARTHROPATHIES AGE <70 W/O C.C.	0.6407
246	8	MED		NON-SPECIFIC ARTHROPATHIES	0.5936
247	8	MED		SIGNS + SYMPTOMS OF MUSCULOSKELETAL SYSTEM + CONNECTIVE TISSUE	0.5797
248	8	MED		TENDONITIS, MYOSITIS + BURSITIS	0.5892
249	8	MED		AFTERCARE, MUSCULOSKELETAL SYSTEM + CONNECTIVE TISSUE	0.7899
250	8	MED		FX, SPRNS, STRNS + DISL OF FOREARM, HAND, FOOT AGE >69 AND/OR C.C.	0.5162
251	8	MED		FX, SPRNS, STRNS + DISL OF FOREARM, HAND, FOOT AGE 18-69 W/O C.C.	0.4004
252	8	MED	*	FX, SPRNS, STRNS + DISL OF FOREARM, HAND, FOOT AGE 0-17	0.3496
253	8	MED		FX, SPRNS, STRNS + DISL OF UPARM, LOWLEG EX FOOT AGE >69 AND/OR C.C.	0.6323
254	8	MED		FX, SPRNS, STRNS + DISL OF UPARM, LOWLEG EX FOOT AGE 18-69 W/O C.C.	0.4931
255	8	MED	*	FX, SPRNS, STRNS + DISL OF UPARM, LOWLEG EX FOOT AGE 0-17	0.4638
256	8	MED		OTHER DIAGNOSES OF MUSCULOSKELETAL SYSTEM + CONNECTIVE TISSUE	0.6993
257	9	SURG		TOTAL MASTECTOMY FOR MALIGNANCY AGE >69 AND/OR C.C.	1.0634
258	9	SURG		TOTAL MASTECTOMY FOR MALIGNANCY AGE <70 W/O C.C.	0.9698
259	9	SURG		SUBTOTAL MASTECTOMY FOR MALIGNANCY AGE >69 AND/OR C.C.	0.8605
260	9	SURG		SUBTOTAL MASTECTOMY FOR MALIGNANCY AGE <70	0.6661
261	9	SURG		BREAST PROCECURE FOR NON-MALIGNANCY EXCEPT BIOPSY + LOCAL EXCISION	0.6104
262	9	SURG		BREAST BIOPSY + LOCAL EXCISION FOR NON-MALIGNANCY	0.4252
263	9	SURG		SKIN-GRAFTS AND/OR DEBRID ULCER OR CELLULITIS AGE >69 AND/OR C.C.	2.4177
264	9	SURG		SKIN-GRAFTS AND/OR DEBRID ULCER OR CELLULITIS AGE <70 W/O C.C.	2.1802
265	9	SURG		SKIN-GRAFT AND/OR DEBIRD EXC SKIN ULCER OR CELLULITIS WITH C.C.	1.3993
266	9	SURG		SKIN-GRAFT AND/OR DEBRID EXC SKIN ULCER OR CELLULITIS W/O C.C.	0.7313
267	9	SURG		PERIANAL + PILONIDAL PROCEDURES	0.6362
268	9	SURG		SKIN, SUBCUTANEOUS TISSUE + BREAST PLASTIC PROCEDURES	0.5690
269	9	SURG		OTHER SKIN, SUBCUT TISS + BREAST O.R. PROC AGE >69 AND/OR C.C.	1.1338
270	9	SURG		OTHER SKIN, SUBCUT TISS + BREAST O.R. PROC AGE <70 W/O C.C.	0.7623

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DRG	MDC			TITLE	RELATIVE WEIGHTS
271	9	MED		SKIN ULCERS	1.2609
272	9	MED		MAJOR SKIN DISORDERS AGE >69 AND/OR C.C.	0.8523
273	9	MED		MAJOR SKIN DISORDERS AGE <70 W/O C.C.	0.7972
274	9	MED		MALIGNANT BREAST DISORDERS AGE >69 AND/OR C.C.	1.0368
275	9	MED		MALIGNANT BREAST DISORDERS AGE <70 W/O C.C.	0.9882
276	9	MED		NON-MALIGNANT BREAST DISORDERS	0.5676
277	9	MED		CELLULITIS AGE >69 AND/OR C.C.	0.8866
278	9	MED		CELLULITIS AGE 18-69 W/O C.C.	0.7594
279	9	MED	*	CELLULITIS AGE 0-17	0.4739
280	9	MED		TRAUMA TO THE SKIN, SUBCUT TISS + BREAST AGE >69 AND/OR C.C.	0.5417
281	9	MED		TRAUMA TO THE SKIN, SUBCUT TISS + BREAST AGE 18-69 W/O C.C.	0.4468
282	9	MED	*	TRAUMA TO THE SKIN, SUBCUT TISS + BREAST AGE 0-17	0.3424
283	9	MED		MINOR SKIN DISORDERS AGE >69 AND/OR C.C.	0.6368
284	9	MED		MINOR SKIN DISORDERS AGE <70 W/O C.C.	0.5172
285	10	SURG		AMPUTATION OF LOWER LIMB FOR ENDOCRINE, NUTRIT + METAB DISORDERS	3.2724
286	10	SURG		ADRENAL + PITUITARY PROCEDURES	2.6731
287	10	SURG		SKIN GRAFTS + WOUND DEBRID FOR ENDOCRINE, NUTRIT + METAB DISORDERS	2.3781
288	10	SURG		O.R. PROCEDURES FOR OBESITY	2.1130
289	10	SURG		PARATHYROID PROCEDURES	1.3308
290	10	SURG		THYROID PROCEDURES	0.8563
291	10	SURG		THYROGLOSSAL PROCEDURES	0.6073
292	10	SURG		OTHER ENDOCRINE, NUTRIT + METAB O.R. PROC AGE >69 AND/OR C.C.	2.3131
293	10	SURG		OTHER ENDOCRINE, NUTRIT + METAB O.R. PROC AGE <70 W/O C.C.	1.7962
294	10	MED		DIABETES AGE >35	0.7454
295	10	MED		DIABETES AGE 0-35	0.7886
296	10	MED		NUTRITIONAL + MISC METABOLIC DISORDERS AGE >69 AND/OR C.C.	0.8271
297	10	MED		NUTRITIONAL + MISC METABOLIC DISORDERS AGE 18-69 W/O C.C.	0.6998
298	10	MED		NUTRITIONAL + MISC METABOLIC DISORDERS AGE 0-17	0.7202
299	10	MED		INBORN ERRORS OF METABOLISM	0.8080
300	10	MED		ENDOCRINE DISORDERS AGE >69 AND/OR C.C.	0.9349

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DRG	MDC		TITLE	RELATIVE WEIGHTS
301	10	MED	ENDOCRINE DISORDERS AGE <70 W/O C.C.	0.6882
302	11	SURG	KIDNEY TRANSPLANT	4.6273
303	11	SURG	KIDNEY, URETER + MAJOR BLADDER PROCEDURE FOR NEOPLASM	2.7610
304	11	SURG	KIDNEY, URETER + MAJOR BLADDER PROC FOR NON-MALIG AGE >69 AND/OR C.C.	2.0323
305	11	SURG	KIDNEY, URETER + MAJOR BLADDER PROC FOR NON-MALIG AGE <70 W/O C.C.	1.4894
306	11	SURG	PROSTATECTOMY AGE >69 AND/OR C.C.	1.2595
307	11	SURG	PROSTATECTOMY AGE <70 W/O C.C.	0.9587
308	11	SURG	MINOR BLADDER PROCEDURES AGE >69 AND/OR C.C.	1.1490
309	11	SURG	MINOR BLADDER PROCEDURES AGE <70 W/O C.C.	0.8665
310	11	SURG	TRANSURETHRAL PROCEDURES AGE >69 AND/OR C.C.	0.7266
311	11	SURG	TRANSURETHRAL PROCEDURES AGE <70 W/O C.C.	0.5563
312	11	SURG	URETHRAL PROCEDURES AGE >69 AND/OR C.C.	0.7308
313	11	SURG	URETHRAL PROCEDURES AGE 18-69 W/O C.C.	0.5936
314	11	SURG *	URETHRAL PROCEDURES AGE 0-17	0.4323
315	11	SURG	OTHER KIDNEY + URINARY TRACT O.R. PROCEDURES	2.7760
316	11	MED	RENAL FAILURE	1.3212
317	11	MED	ADMIT FOR RENAL DIALYSIS	0.4907
318	11	MED	KIDNEY + URINARY TRACT NEOPLASMS AGE >69 AND/OR C.C.	0.9231
319	11	MED	KIDNEY + URINARY TRACT NEOPLASMS AGE <70 W/O C.C.	0.7418
320	11	MED	KIDNEY + URINARY TRACT INFECTIONS AGE >69 AND/OR C.C.	0.8629
321	11	MED	KIDNEY + URINARY TRACT INFECTIONS AGE 18-69 W/O C.C.	0.6753
322	11	MED	KIDNEY + URINARY TRACT INFECTIONS AGE 0-17	0.6998
323	11	MED	URINARY STONES AGE >69 AND/OR C.C.	0.5863
324	11	MED	URINARY STONES AGE <70 W/O C.C.	0.4098
325	11	MED	KIDNEY + URINARY TRACT SIGNS + SYMPTOMS AGE >69 AND/OR C.C.	0.6504
326	11	MED	KIDNEY + URINARY TRACT SIGNS + SYMPTOMS AGE 18-69 W/O C.C.	0.5159
327	11	MED	KIDNEY + URINARY TRACT SIGNS + SYMPTOMS AGE 0-17	0.5511
328	11	MED	URETHRAL STRICTURE AGE >69 AND/OR C.C.	0.5939
329	11	MED	URETHRAL STRICTURE AGE 18-69 W/O C.C.	0.4870
330	11	MED *	URETHRAL STRICTURE AGE 0-17	0.2788

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DRG	MDC		TITLE	RELATIVE WEIGHTS
331	11	MED	OTHER KIDNEY + URINARY TRACT DIAGNOSES AGE >69 AND/OR C.C.	0.8333
332	11	MED	OTHER KIDNEY + URINARY TRACT DIAGNOSES AGE 18-69 W/O C.C.	0.6740
333	11	MED	OTHER KIDNEY + URINARY TRACT DIAGNOSES AGE 0-17	0.7915
334	12	SURG	MAJOR MALE PELVIC PROCEDURES WITH C.C.	1.8038
335	12	SURG	MAJOR MALE PELVIC PROCEDURES W/O C.C.	1.4644
336	12	SURG	TRANSURETHRAL PROSTATECTOMY AGE >69 AND/OR C.C.	0.9871
337	12	SURG	TRANSURETHRAL PROSTATECTOMY AGE <70 W/O C.C.	0.7788
338	12	SURG	TESTES PROCEDURES FOR MALIGNANCY	0.8907
339	12	SURG	TESTES PROCEDURES, NON-MALIGNANT AGE >17	0.5766
340	12	SURG *	TESTES PROCEDURES, NON-MALIGNANT AGE 0-17	0.4335
341	12	SURG	PENIS PROCEDURES	0.9974
342	12	SURG	CIRCUMCISION AGE >17	0.4266
343	12	SURG *	CIRCUMCISION AGE 0-17	0.3788
344	12	SURG	OTHER MALE REPRODUCTIVE SYSTEM O.R. PROCEDURES FOR MALIGNANCY	1.1216
345	12	SURG	OTHER MALE REPRODUCTIVE SYSTEM O.R. PROC EXCEPT FOR MALIGNANCY	0.8196
346	12	MED	MALIGNANCY, MALE REPRODUCTIVE SYSTEM AGE >69 AND/OR C.C.	0.8569
347	12	MED	MALIGNANCY, MALE REPRODUCTIVE SYSTEM AGE <70 W/O C.C.	0.6441
348	12	MED	BENIGN PROSTATIC HYPERTROPHY AGE >69 AND/OR C.C.	0.6260
349	12	MED	BENIGN PROSTATIC HYPERTROPHY AGE <70 W/O C.C.	0.4854
350	12	MED	INFLAMMATION OF THE MALE REPRODUCTIVE SYSTEM	0.6270
351	12	MED	STERILIZATION, MALE	0.3334
352	12	MED	OTHER MALE REPRODUCTIVE SYSTEM DIAGNOSES	0.5388
353	13	SURG	PELVIC EVISCERATION, RADICAL HYSTERECTOMY + VULVECTOMY	1.8818
354	13	SURG	NON-RADICAL HYSTERECTOMY AGE >69 AND/OR C.C.	1.2335
355	13	SURG	NON-RADICAL HYSTERECTOMY AGE <70 W/O C.C.	0.9767
356	13	SURG	FEMALE REPRODUCTIVE SYSTEM RECONSTRUCTIVE PROCEDURES	0.8511
357	13	SURG	UTERUS + ADENEXA PROCEDURES FOR MALIGNANCY	2.1101
358	13	SURG	UTERUS + ADENEXA PROC FOR NON-MALIGNANCY EXCEPT TUBAL INTERRUPT	1.1185
359	13	SURG	INCISIONAL TUBAL INTERRUPTION FOR NON-MALIGNANCY	0.5044
360	13	SURG	VAGINA, CERVIX + VULVA PROCEDURES	0.6055

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DRG	MDC		TITLE	RELATIVE WEIGHTS
361	13	SURG	LAPAROSCOPY + ENDOSCOPY (FEMALE) EXCEPT TUBAL INTERRUPTION	0.7063
362	13	SURG	LAPAROSCOPIC TUBAL INTERRUPTION	0.3596
363	13	SURG	D+C, CONIZATION + RADIO-IMPLANT FOR MALIGNANCY	0.6176
364	13	SURG	D+C, CONIZATION EXCEPT FOR MALIGNANCY	0.3922
365	13	SURG	OTHER FEMALE REPRODUCTIVE SYSTEM O.R. PROCEDURES	1.9086
366	13	MED	MALIGNANCY, FEMALE REPRODUCTIVE SYSTEM AGE >69 AND/OR C.C.	0.8626
367	13	MED	MALIGNANCY, FEMALE REPRODUCTIVE SYSTEM AGE <70 W/O C.C.	0.5354
368	13	MED	INFECTIONS, FEMALE REPRODUCTIVE SYSTEM	0.7610
369	13	MED	MENSTRUAL + OTHER FEMALE REPRODUCTIVE SYSTEM DISORDERS	0.5498
370	14	SURG	CESAREAN SECTION WITH C.C.	1.0856
371	14	SURG	CESAREAN SECTION W/O C.C.	0.7670
372	14	MED	VAGINAL DELIVERY WITH COMPLICATING DIAGNOSES	0.5945
373	14	MED	VAGINAL DELIVERY W/O COMPLICATING DIAGNOSES	0.3538
374	14	SURG	VAGINAL DELIVERY WITH STERILIZATION AND/OR D+C	0.5755
375	14	SURG *	VAGINAL DELIVERY WITH O.R. PROC EXCEPT STERIL AND/OR D+C	0.6817
376	14	MED	POSTPARTUM AND POSTABORTION DIAGNOSES W/O O.R. PROCEDURE	0.4523
377	14	SURG	POSTPARTUM AND POSTABORTION DIAGNOSES WITH O.R. PROCEDURE	0.7886
378	14	MED	ECTOPIC PREGNANCY	0.7358
379	14	MED	THREATENED ABORTION	0.2409
380	14	MED	ABORTION W/O D+C	0.3609
381	14	MED	ABORTION WITH D+C, ASPIRATION CURETTAGE, OR HYSTEROTOMY	0.3783
382	14	MED	FALSE LABOR	0.1137
383	14	MED	OTHER ANTEPARTUM DIAGNOSES WITH MEDICAL COMPLICATIONS	0.4453
384	14	MED	OTHER ANTEPARTUM DIAGNOSES W/O MEDICAL COMPLICATIONS	0.4586
385	15		* NEONATES, DIED OR TRANSFERRED	0.6811
386	15		* EXTREME IMMATURITY OR RESPIRATORY DISTRESS SYNDROME, NEONATE	3.6480
387	15		* PREMATURITY WITH MAJOR PROBLEMS	1.8267
388	15		* PREMATURITY W/O MAJOR PROBLEMS	1.1571
389	15		* FULL TERM NEONATE WITH MAJOR PROBLEMS	0.5425
390	15		* NEONATES WITH OTHER SIGNIFICANT PROBLEMS	0.3486

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DRG	MDC			TITLE	RELATIVE WEIGHTS
391	15		*	NORMAL NEWBORNS	0.2218
392	16	SURG		SPLENECTOMY AGE >17	3.2494
393	16	SURG	*	SPLENECTOMY AGE 0-17	1.5206
394	16	SURG		OTHER O.R. PROCEDURES OF THE BLOOD + BLOOD-FORMING ORGANS	1.0891
395	16	MED		RED BLOOD CELL DISORDERS AGE >17	0.7153
396	16	MED		RED BLOOD CELL DISORDERS AGE 0-17	0.2952
397	16	MED		COAGULATION DISORDERS	0.9971
398	16	MED		RETICULOENDOTHELIAL + IMMUNITY DISORDERS AGE >69 AND/OR C.C.	0.9753
399	16	MED		RETICULOENDOTHELIAL + IMMUNITY DISORDERS AGE <70 W/O C.C.	0.7247
400	17	SURG		LYMPHOMA OR LEUKEMIA WITH MAJOR O.R. PROCEDURE	2.6646
401	17	SURG		LYMPHOMA OR LEUKEMIA WITH OTHER O.R. PROC AGE >69 AND/OR C.C.	1.5902
402	17	SURG		LYMPHOMA OR LEUKEMIA WITH OTHER O.R. PROCEDURE AGE <70 W/O C.C.	1.0555
403	17	MED		LYMPHOMA OR LEUKEMIA AGE >69 AND/OR C.C.	1.3279
404	17	MED		LYMPHOMA OR LEUKEMIA AGE 18-69 W/O C.C.	1.0449
405	17	MED	*	LYMPHOMA OR LEUKEMIA AGE 0-17	1.0407
406	17	SURG		MYELOPROLIF DISORD OR POORLY DIFF NEOPLASM W MAJ O.R. PROC + C.C.	2.5307
407	17	SURG		MYELOPROLIF DISORD OR POORLY DIFF NEOPLASM W MAJ O.R. PROC W/O C.C.	1.7127
408	17	SURG		MYELOPROLIF DISORD OR POORLY DIFF NEOPLASM WITH OTHER O.R. PROC	1.0502
409	17	MED		RADIOTHERAPY	0.9856
410	17	MED		CHEMOTHERAPY	0.4285
411	17	MED		HISTORY OF MALIGNANCY W/O ENDOSCOPY	0.5907
412	17	MED		HISTORY OF MALIGNANCY WITH ENDOSCOPY	0.3389
413	17	MED		OTHER MYELOPROLIF DISORD OR POORLY DIFF NEOPL DX AGE >69 AND/OR C.C.	1.0457
414	17	MED		OTHER MYELOPROLIF DISORD OR POORLY DIFF NEOPL DX AGE <70 W/O C.C.	0.8984
415	18	SURG		O.R. PROCEDURE FOR INFECTIOUS + PARASITIC DISEASES	3.3292
416	18	MED		SEPTECEMIA AGE >17	1.6183
417	18	MED		SEPTECEMIA AGE 0-17	1.1532
418	18	MED		POSTOPERATIVE + POST-TRAUMATIC INFECTIONS	1.0026
419	18	MED		FEVER OF UNKNOWN ORIGIN AGE >69 AND/OR C.C.	0.9306
420	18	MED		FEVER OF UNKNOWN ORIGIN AGE 18-69 W/O C.C.	0.8319

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DRG	MDC			TITLE	RELATIVE WEIGHTS
421	18	MED		VIRAL ILLNESS AGE >17	0.5674
422	18	MED		VIRAL ILLNESS + FEVER OF UNKNOWN ORIGIN AGE 0-17	0.6582
423	18	MED		OTHER INFECTIOUS + PARASITIC DISEASES DIAGNOSES	1.3207
424	19	SURG		O.R. PROCEDURES WITH PRINCIPAL DIAGNOSIS OF MENTAL ILLNESS	2.2112
425	19	MED		ACUTE ADJUST REACT + DISTURBANCES OF PSYCHOSOCIAL DYSFUNCTION	0.6097
426	19	MED		DEPRESSIVE NEUROSES	0.8330
427	19	MED		NEUROSES EXCEPT DEPRESSIVE	0.7019
428	19	MED		DISORDERS OF PERSONALITY + IMPULSE CONTROL	0.8513
429	19	MED		ORGANIC DISTURBANCES + MENTAL RETARDATION	0.8424
430	19	MED		PSYCHOSES	1.0762
431	19	MED		CHILDHOOD MENTAL DISORDERS	0.8495
432	19	MED		OTHER DIAGNOSES OF MENTAL DISORDERS	0.6969
433	20			SUBSTANCE USE AND INDUCED ORGANIC MENTAL DISORDERS, LEFT AMA	0.3906
434	20			SUBSTANCE ABUSE, INTOX INDUCE MNTL SYN EXC DEPEND AND/OR OTH SYMPT TRT	0.7098
435	20			SUBSTANCE DEPENDENCE, DETOX AND/OR OTHER SYMPTOMATIC TREATMENT	0.7980
436	20			SUBSTANCE DEPENDECE WITH REHABILITATION THERAPY	1.0166
437	20			SUBSTANCE DEPENDENCE, COMBINED REHABILITATION AND DETOX THERAPY	1.3276
438	20			NO LONGER VALID	0.0000
439	21	SURG		SKIN GRAFTS FOR INJURIES	1.7930
440	21	SURG		WOUND DEBRIDEMENTS FOR INJURIES	2.0315
441	21	SURG		HAND PROCEDURES FOR INJURIES	0.7305
442	21	SURG		OTHER O.R. PROCEDURES FOR INJURIES AGE >69 AND/OR C.C.	1.8156
443	21	SURG		OTHER O.R. PROCEDURES FOR INJURIES AGE <70 W/O C.C.	1.4872
444	21	MED		MULTIPLE TRAUMA AGE >69 AND/OR C.C.	0.7074
445	21	MED		MULTIPLE TRAUMA AGE 18-69 W/O C.C.	0.6015
446	21	MED	*	MULTIPLE TRAUMA AGE 0-17	0.4796
447	21	MED		ALLERGIC REACTIONS AGE >17	0.4471
448	21	MED	*	ALLERGIC REACTIONS AGE 0-17	0.3470
449	21	MED		POISONING AND TOXIC EFFECTS OF DRUGS AGE >69 AND/OR C.C.	0.6954
450	21	MED		POISONING AND TOXIC EFFECTS OF DRUGS AGE 18-69 W/O C.C.	0.5422

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DRG	MDC		TITLE	RELATIVE WEIGHTS
451	21	MED	POISONING AND TOXIC EFFECTS OF DRUGS 0-17	0.5498
452	21	MED	COMPLICATIONS OF TREATMENT AGE >69 AND/OR C.C.	0.8080
453	21	MED	COMPLICATIONS OF TREATMENT AGE <70 W/O C.C.	0.7505
454	21	MED	OTHER INJURIES, POISONINGS + TOXIC EFF DIAG AGE >69 AND/OR C.C.	0.8098
455	21	MED	OTHER INJURIES, POISONINGS + TOXIC EFF DIAG AGE <70 W/O C.C.	0.6003
456	22		BURNS, TRANSFERRED TO ANOTHER ACUTE CARE FACILITY	1.8156
457	22		EXTENSIVE BURNS	7.5688
458	22	SURG	NON-EXTENSIVE BURNS WITH SKIN GRAFTS	3.9455
459	22	SURG	NON-EXTENSIVE BURNS WITH WOUND DEBRIDEMENT + OTHER O.R. PROC	3.2662
460	22	MED	NON-EXTENSIVE BURNS W/O O.R. PROCEDURE	1.1595
461	23	SURG	O.R. PROC WITH DIAGNOSES OF OTHER CONTACT WITH HEALTH SERVICES	1.3572
462	23	MED	REHABILITATION	2.1408
463	23	MED	SIGNS + SYMPTOMS WITH C.C.	0.7951
464	23	MED	SIGNS + SYMPTOMS W/O C.C.	0.6948
465	23	MED	AFTERCARE WITH HISTORY OF MALIGNANCY AS SECONDARY DIAGNOSIS	0.2882
466	23	MED	AFTERCARE W/O HISTORY OF MALIGNANCY AS SECONDARY DIAGNOSIS	0.4153
467	23	MED	OTHER FACTORS INFLUENCING HEALTH STATUS	0.7223
468			UNRELATED O.R. PROCEDURE	2.4542
469			PRINCIPAL DIAGNOSIS INVALID AS DISCHARGE DIAGNOSIS	0.0000
470			UNGROUPABLE	0.0000
471		SURG	BILATERAL OR MULTIPLE MAJOR JOINT PROCEDURES OF THE LOWER EXTREMITIES	3.8994

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PROSPECTIVE PAYMENT ASSESSMENT C
300 7TH STREET, S.W., SUITE 301B, WASHIN